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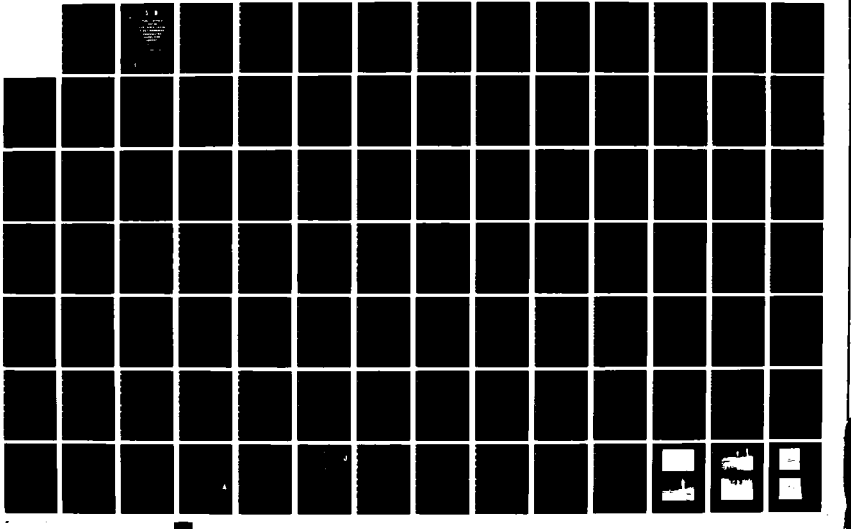

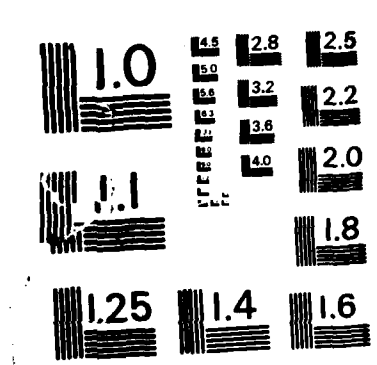

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PUBLIC WORKS CENTER YOKOSUKA, JAPAN FLEET MOORINGS UNDERWATER INSPECTION REPORT

SEPTEMBER 1983

OCEAN ENGINEERING
AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D.C. 20374

FPO-1-83 (25)

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Of the 20 moorings inspected, 9 were found to be satisfactory for continued use at their rated class, 10 require reclassification or downgrading to a lower mooring class, and 1 was found to be in poor condition and recommended for overhaul at the earliest practical time.

In addition, a thorough design review should be conducted to determine the adequacy of these Japanese designed and built moorings to withstand the forces associated with the various mooring classes defined in NAVFACENGCOM's DM-26.

Specific comments concerning each of these moorings and recommendations for future actions are included within this report.

Abstract

This report contains results of the inspection of 20 fleet moorings operated and maintained by the Public Works Center, Yokosuka, Japan. A CHESNAVFACENGCOM-assigned Engineer-in-Charge and divers from Underwater Construction Team Two conducted the inspection from 1-7 May 1983.

Of the 20 moorings inspected, 9 were found to be satisfactory for continued use at their rated class, 10 require reclassification or downgrading to a lower mooring class, and 1 was found to be in poor condition and recommended for overhaul at the earliest practical time.

In addition, a thorough design review should be conducted to determine the adequacy of these Japanese designed and built moorings to withstand the forces associated with the various mooring classes defined in NAVFACENGCOM's DM-26.

Specific comments concerning each of these moorings and recommendations for future actions are included within this report.

TABLE OF CONTENTS

PWC YOKOSUKA FLEET MOORING INSPECTION REPORT

1.0 INTRODUCTION

1.1 Background. Under the COMNAVFACENGCOM Fleet Mooring Maintenance (FMM) Program, CHESNAVFACENGCOM has been assigned the responsibility to plan and conduct periodic diver inspections of all fleet moorings worldwide. In carrying out this responsibility, CHESNAVFACENGCOM designated an Engineer-in-Charge (EIC) to provide inspection planning and onsite technical direction for the underwater inspection of fleet moorings located near the Public Works Center Yokosuka, Japan. The actual underwater portion of the inspection was performed by divers of Underwater Construction Team Two (UCT TWO). The inspection was conducted 1-7 May 1983.

1.2 General Mooring History. PWC Yokosuka currently operates and maintains 20 fleet moorings, all of which are originally of Japanese design. These are reported as eight CC-, two A-, and ten D-class moorings. The geographic locations of these moorings in relation to the US Fleet Activity, Yokosuka, and Tokyo Bay are shown in Figures 1 and 2.

Of the 20 moorings, 10 are incorporated into 2 mooring clusters. Six of the CC-class moorings (D2N, D2S, D3N, D3S, D4N, and D4S) are incorporated into one cluster (see Figure 3) while four D-class moorings (X-6, X-7, X-8, and X-9) comprise the second cluster (Figure 4). As can be noted in both of these schematics of mooring clusters, two moorings share a common leg. In Figure 4, for example, the southwestern leg of mooring X-6 is the northeastern leg of mooring X-7. The remaining ten moorings are either free-swinging moorings or bow/stern moorings.

Table 1 contains a summation of the PWC Yokosuka mooring numbers, classes, and dates of last mooring overhauls.

2.0 INSPECTION PROCEDURES

2.1 Inspection Objectives. The purpose of the mooring inspections was to determine the general physical condition of the buoys and chain assemblies and, when possible, to verify or update existing as-built and maintenance records. Divers inspected only a

FIGURE 1. GEOGRAPHICAL POSITION OF YOKOSUKA

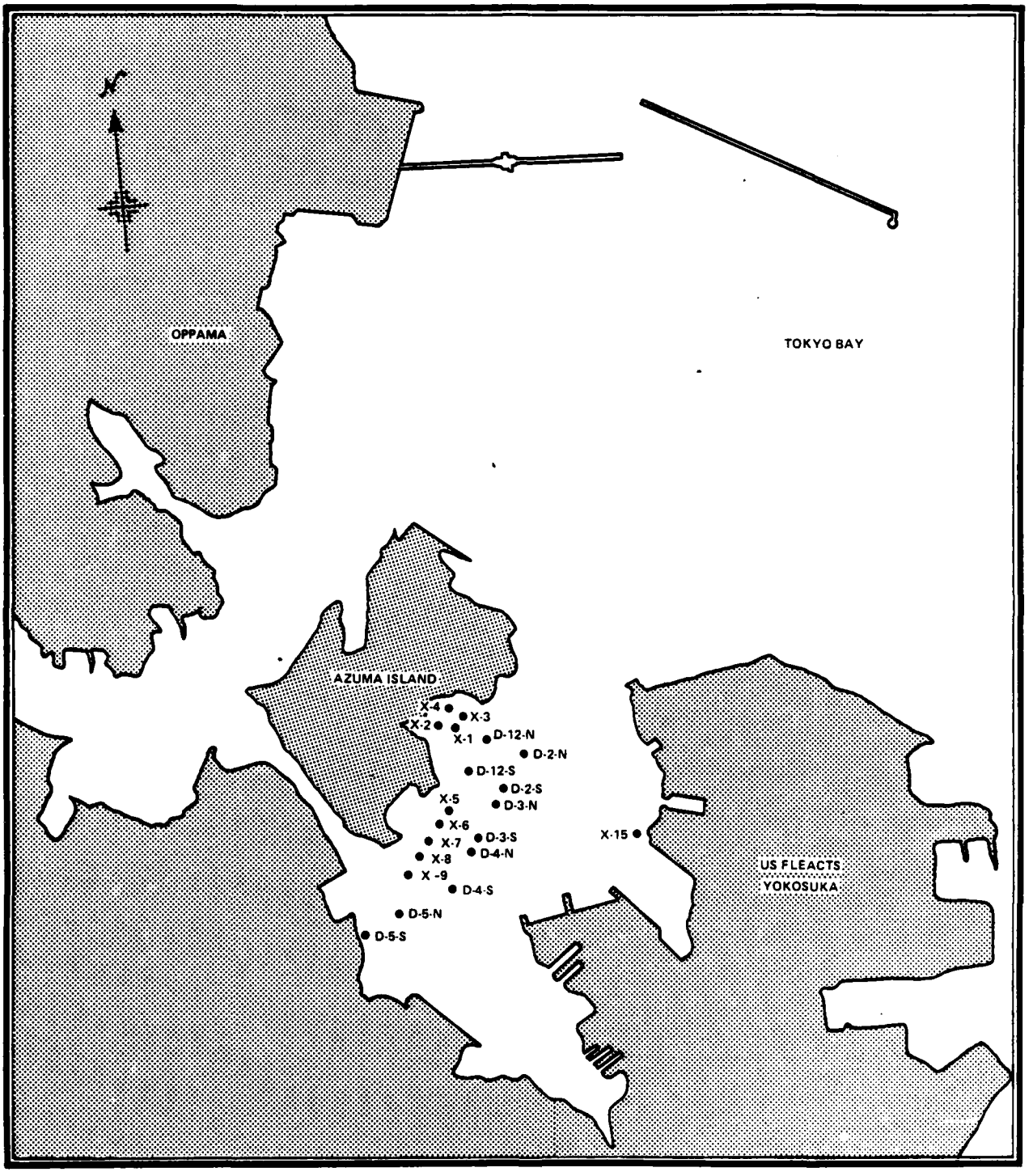


FIGURE 2. PWC YOKOSUKA MOORINGS

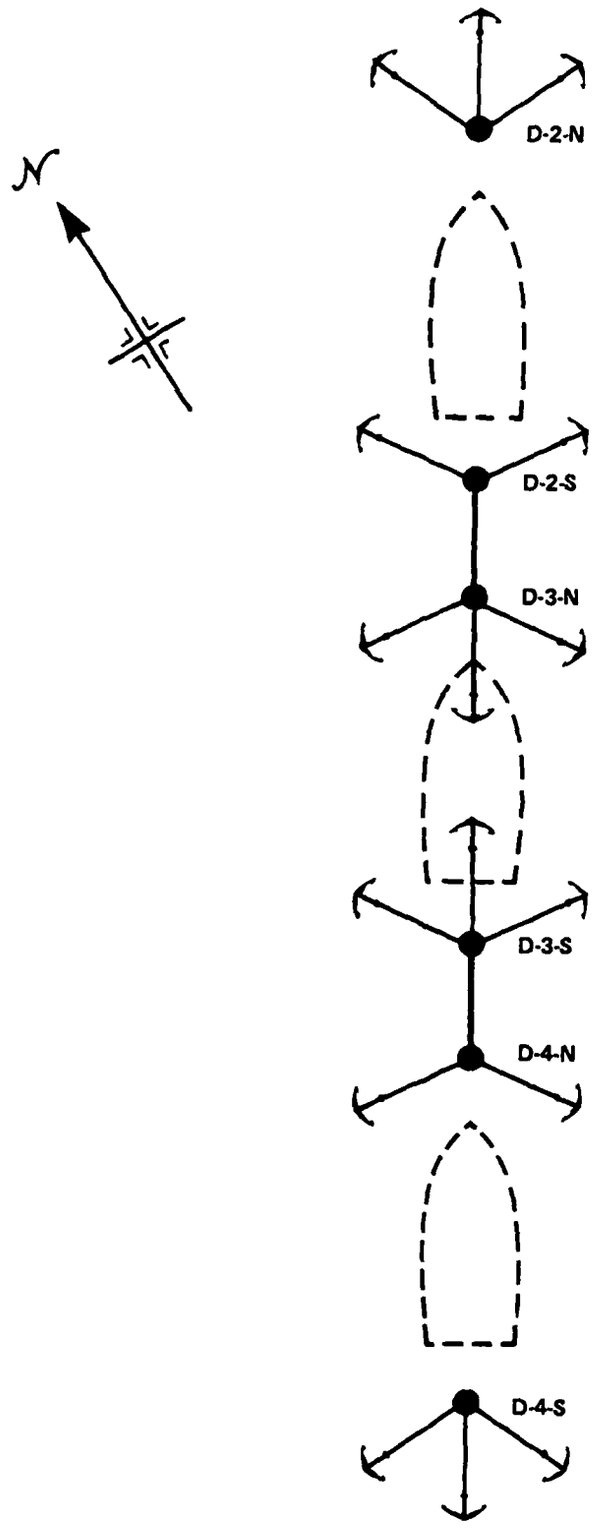


FIGURE 3. SCHEMATIC OF MOORING CLUSTER D-2 THROUGH D-4

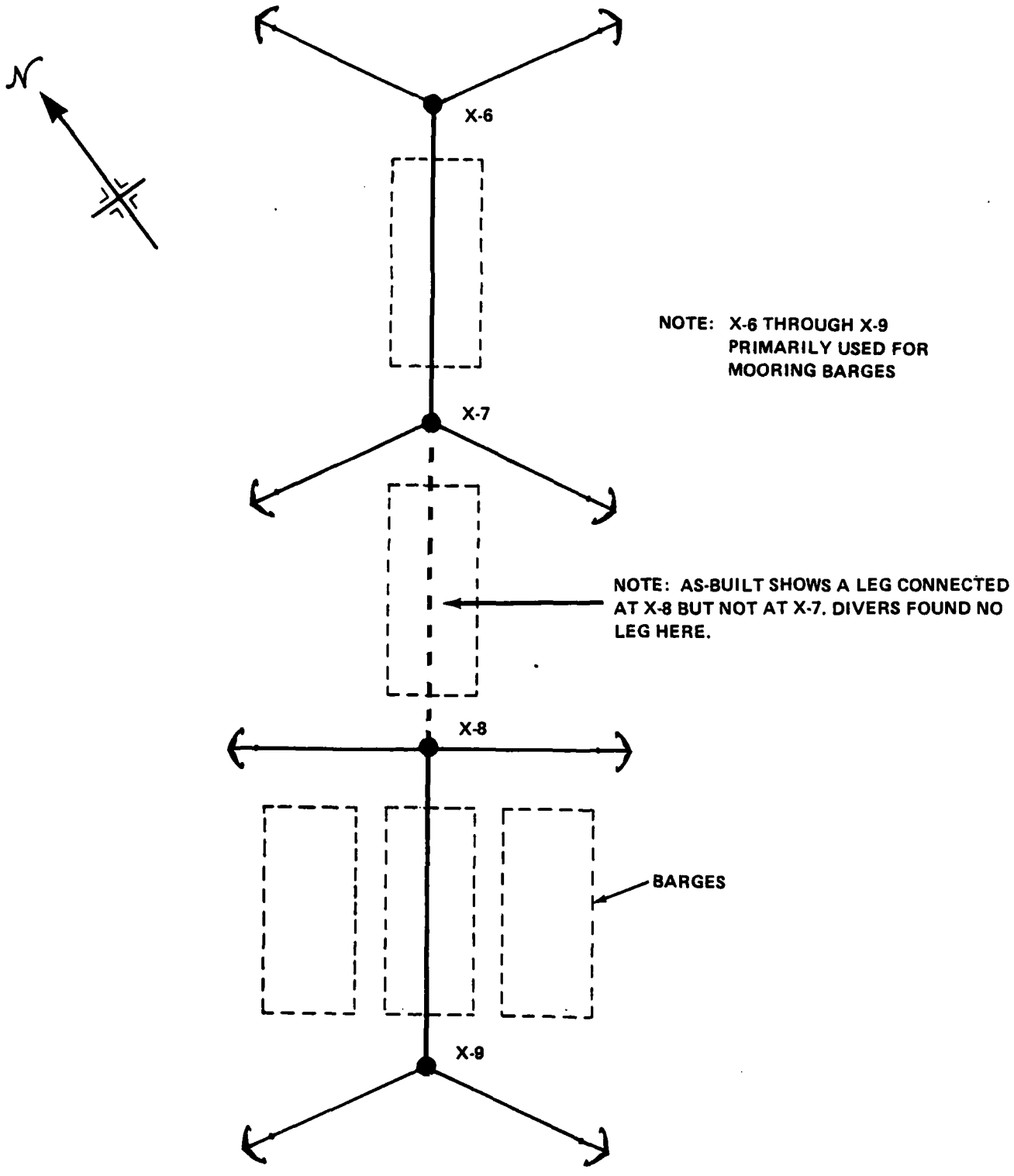


FIGURE 4. SCHEMATIC OF MOORING CLUSTER X-6 THROUGH X-9

TABLE 1. PWC YOKOUSKA FLEET MOORINGS

MOORING NUMBER	MOORING CLASS	WATER DEPTH (FT.)	LAST OVERHAUL	LAST REPORTED CONDITION
D-12-N	AR	42	SEP 82	Good
D-12-S	AR	30	APR 83	Fair
D-2-N	CCR	46	SEP 82	Fair
D-2-S	CCR	47	SEP 82	Fair
D-3-N	CCR	47	SEP 82	Good
D-3-S	CCR	40	SEP 82	Good
D-4-N	CCR	39	SEP 82	Good
D-4-S	CCR	39	SEP 82	Fair
D-5-N	CCR	34	APR 83	Fair
D-5-S	CCR	30	APR 83	Fair
X-1	DR	32	SEP 82	Fair
X-2	DR	20	SEP 82	Fair
X-3	DR	34	SEP 82	Good
X-4	DR	14	SEP 82	Fair
X-5	DR	26	SEP 82	Good
X-6	DR	26	SEP 82	Fair
X-7	DR	30	SEP 82	Good
X-8	DR	30	SEP 82	Fair
X-9	DR	30	SEP 82	Fair
X-15	DR	43	SEP 82	Fair

NOTE: Above data provided to CHESNAVFACENGCOM by PWC Yokosuka in April 1983.

portion of the submerged buoy hull and chain assemblies in order to compile a general description of the mooring's condition. The existence of fairly consistent measurements during this inspection provides a good indication of the mooring's overall condition. It should be kept in mind that periodic underwater inspections are intended as an expedient and relatively inexpensive supplement to accurate maintenance records. As such, they cannot fully substitute for a complete inspection involving recovery of the mooring and the measurement and evaluation of each component.

Chain wire diameter measurements are used to evaluate the condition of a mooring. After the chain was cleaned to bare metal, a selective sampling of the wire diameter of chain links and connecting hardware was taken in order to determine the amount of deterioration due to corrosion and wear. "Single link" measurements were taken where the chain was slack to detect corrosion loss. "Double link" measurements were taken where two links connected under tension to detect the combined effects of corrosion and wear. Chain links and other components which measured 90 percent or greater of original wire diameter are considered to be in "good" condition; measurement between 80 percent and 90 percent of original diameter is considered "fair" condition and is usually cause for the mooring to be downgraded in classification; any measurement less than 80 percent is considered "poor" and is cause for the mooring to be declared unsatisfactory for fleet use.

When a mooring is constructed from oversized chain, a measurement between 80 and 90 percent of the original wire size results in a mooring being considered in "fair condition", but no downgrading is required if the worn chain is still larger than required.

Standard underwater inspection procedures do not call for the inspection of any part of the mooring which has been buried. Ground legs and risers were observed only to the point at which they became buried; no attempt was made to locate and inspect anchors or other mooring materials which were not readily visible.

2.2 Buoy.

2.2.1 Buoy Topside. Each buoy was inspected to determine its general condition. The buoy markings were checked for conformance to those noted in applicable charts. Physical damage such as holes, dents, or listing was described. The fiberglass was inspected for cracks, wear, peeling, or rust-bleeding. Hatches, openings, and penetrations were examined and worn material and rust were reported.

The buoy fenders and chafing rails were checked for integrity and secure connection to the buoy. Buoy top jewelry was measured with calipers to find the overall outside dimensions and areas of most severe reduction in wire size.

2.2.2 **Buoy Lower Portion.** Divers inspected the buoy below the waterline. The thickness of marine growth was recorded, two 1-foot-square areas were selected and cleared of growth without damaging the fiberglass, and the condition of the fiberglass was noted.

2.3 **Riser.** To determine chain wear, each riser chain was inspected by taking three consecutive double link measurements, using precut gauges and/or calipers, at both ends and at the center of the riser. To determine original chain size, divers took single link caliper measurements of the wire diameter. Divers also documented the type of hardware connecting the riser chain to the sinker. In many cases, Japanese chain of sizes between standard American sizes was installed. When this occurred, the divers used the next larger precut gauge, and all measurements below 80 percent were verified with calipers.

2.4 **Ground Legs.** To determine chain wear, three consecutive double link measurements were made at both ends and at the center of each leg until the chain was buried in the seafloor. Where a segment of chain was resting on the bottom and was not in tension, single link measurements were taken instead of double link measurements. To determine original chain size, divers took single link caliper measurements of its wire diameter. The hardware connecting the ground legs to the sinker was documented.

2.5 **Sinkers.** When visible, the sinkers were examined for general or localized wear. Wire diameters of the sinker hairpins were measured with calipers.

2.6 **Anchors.** No anchors were sighted during the course of the inspection

2.7 **Buoy Survey.** With the assistance of the Public Works Office, a rough geographic survey was conducted. Preliminary survey markers were created and marked with paint only until more permanent concrete monuments can be installed. The data in Appendix B gives the benchmark locations and the transit angles to the buoys obtained by backsighting from known points ashore. Until the new benchmarkers are accurately surveyed and tied into the local grid, no precise determination of the buoy locations can be made from this data.

3.0 INSPECTION SUMMARY

An in-depth discussion of the inspection results is contained in Annex A. Annex B contains buoy location survey data, Annex C contains photographs, and Annex D contains a copy of the preliminary report of the results of the inspection. A detailed evaluation of the information gathered during the inspection indicates the following:

- Of the 20 moorings inspected, 4 are in good condition and are satisfactory for continued use at their rated class; 3 are in good condition but should be reclassified due to undersized leg chain; 5 are in fair condition and satisfactory for their rated class due to oversized chain; 7 are in fair condition and should be downgraded; and 1 is in poor condition and should be overhauled. Table 2 presents the status of the PWC Yokosuka fleet moorings.

- Per DM-26, a class CC mooring requires three double legs attached to three spider plates. Although eight of the PWC Yokosuka moorings have been reported as CC class, each has only three or four single legs and, therefore, does not meet the DM-26 requirements for a class CC mooring.

- The schematic drawing of mooring X-1 indicates that its two ground legs should be 80 degrees apart. In fact, these legs are parallel to each other and high lateral wind loadings could result in lateral displacement of a vessel moored between moorings X-1 and X-2.

- Only three of the four ground legs of mooring D3S were found to be connected to the sinker, and their orientation could not be determined. This missing leg could adversely affect the performance of other moorings D3N, D4N, and D4S within the cluster of moorings of which mooring D3S is a part.

- The schematic drawing of mooring X-8 (Figure A-18) shows that its two anchors are installed 180 degrees apart. Since X-8 is part of a bow/stern mooring, this angular orientation may be too large for the anchors to develop sufficient holding power when a large load is applied perpendicular to a line between the two anchors.

- o The ground legs of half of the mooring systems (10 of 20) were completely buried in the mud bottom and inaccessible for inspection.

- o None of the PWC Yokosuka fleet moorings have a cathodic protection system installed.

4.0 COMMENTS/RECOMMENDATIONS

As a result of an analysis of the data collected during the inspection, the following comments/recommendations are pertinent:

- o Since none of the moorings reported as CC class meet DM-26 requirements for this class mooring, each of these should be downgraded commensurate with the number, wire size, and condition of its ground legs.

- o The parallel legs of mooring X-1 should be removed, reoriented, and reinstalled during the next scheduled overhaul.

- o In view of the missing ground leg of mooring D3S, recommend that the design of the mooring cluster be reviewed in order to determine the gravity of the loss of this leg on the performance of the overall cluster.

- o The perpendicular legs of mooring X-8 should be repositioned 120° apart during the next scheduled overhaul.

- o Since the vast majority of these moorings were designed and built by the Japanese, probably prior to World War II, a review of the design of each of these moorings should be conducted in order to determine whether the current configurations are adequate to meet expected load requirements.

TABLE 2

INSPECTION SUMMARY

MOORING NUMBER	REPORTED CLASS	CONDITION			REMARKS	STATUS
		GOOD	FAIR	POOR		
D12N	AR	✓			Reclassfify to class B mooring due to wire diameter of ground legs	SAT
D12S	AR		✓		Reclassify to class B mooring due to worn riser and wire diameter of ground legs	SAT
CLUSTER CONFIGURATION D2N	CCR		✓		Reclassify to class C mooring to correspond with condition of D2S	SAT
CLUSTER CONFIGURATION D2S	CCR		✓		Reclassify to class C mooring due to wire diameter of ground legs	SAT
CLUSTER CONFIGURATION D3N	CCR		✓		Reclassify to class B mooring due to wire diameter of ground legs	SAT
CLUSTER CONFIGURATION D3S	CCR			✓	One of four ground legs missing. Review entire mooring cluster for adequacy	UNSAT
CLUSTER CONFIGURATION D4N	CCR	✓			Reclassify to class C mooring due to wire diameter of ground legs	SAT
CLUSTER CONFIGURATION D4S	CCR	✓			Reclassify to class C mooring to correspond with condition of D4N	SAT
D5N	CCR		✓		Reclassify to class D mooring due to wire diameter of ground legs	SAT
D5S	CCR		✓		Reclassify to class D mooring to correspond with condition of D5N	SAT

TABLE 2 (CONT'D)

INSPECTION SUMMARY

MOORING NUMBER	REPORTED CLASS	CONDITION			REMARKS	STATUS
		GOOD	FAIR	POOR		
X-1	DR		✓		Two ground legs run parallel into the bottom.	SAT
X-2	DR	✓				SAT
X-3	DR	✓				SAT
X-4	DR		✓		Downgrade to a class F mooring due to worn ground legs.	SAT
X-5	DR		✓		Oversized chain.	SAT
X-6	DR		✓		Oversized chain.	SAT
X-7	DR		✓		Oversized chain.	SAT
X-8	DR	✓				SAT
X-9	DR		✓		Oversized chain.	SAT
X-15	DR	✓				SAT
TOTALS		7	12	1		

CLUSTER CONFIGURATION

ANNEX A

MOORING INSPECTION RESULTS

This Annex contains the following information for each mooring:

- a summation of the inspection data obtained by the CHESNAVFACENGCOM EIC and UCT-TWO divers,
- a diver data reporting form, and
- a schematic drawing of the mooring which includes the latest as-built information. These drawings were submitted to CHESNAVFACENGCOM by PWC Yokosuka in April 1983.

Table A-1 lists the mooring class chain size requirements and was used in formulating the recommendations for downgrading certain PWC Yokosuka fleet moorings. Where chain was buried in the mud, preventing direct diver measurement, the record drawings were considered the best available data. In some cases diver measurements were used to update as-built dimensions. These updates are noted on the schematics.

TABLE A-1
MOORING CLASS CHAIN SIZE REQUIREMENTS

Mooring Class	Required Wire Diameter (in) Riser Chain	Ground Legs
AA	4	Double Legs { 2 3/4
BB	3 1/2	Double Legs { 2 1/2
CC	3 1/2	Double Legs { 2 1/4
DD	3	3
A	2 3/4	2 3/4
B	2 1/2	2 1/2
C	2 1/4	2 1/4
D	2	2
E	1 3/4	1 3/4
F	1 1/4	1 1/4
G	3/4	3/4

SOURCE: COMNAVFACENGCOM Design Manual Twenty-Six (DM-26), "Harbor and Coastal Facilities"

INSPECTION RESULTS
MOORING D12N

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy was fiberglass coated, but the fiberglass is badly chipped. The hull of the buoy below the waterline is covered with several inches of heavy marine growth. The top of the riser measured greater than 90 percent of its original wire diameter but is moderately rusted. The chafing rail is badly dented.

Riser

The riser is 3-inch chain and measurements taken were all greater than 90 percent. In fact, the smallest double link measurement taken was 5 7/8 inches. The riser enters the bottom at a water depth of 40 feet.

Ground Legs/Sinkers/Anchors

Not visible for inspection.

Recommendation

This mooring is in good condition.

As-built information contained in Figure A-1 reveals that the legs of this mooring were 2-1/2 inch wire diameter when installed. A class A mooring requires ground legs of 2 3/4-inch diameter. Therefore, recommend that this mooring be reclassified from a class A to a class B mooring.

MOORING NO.: D12N CLASS: A LOCATION: YOKOSUKA LAT: 139°39'-29"N LONG: 35°-17'-41.5"E

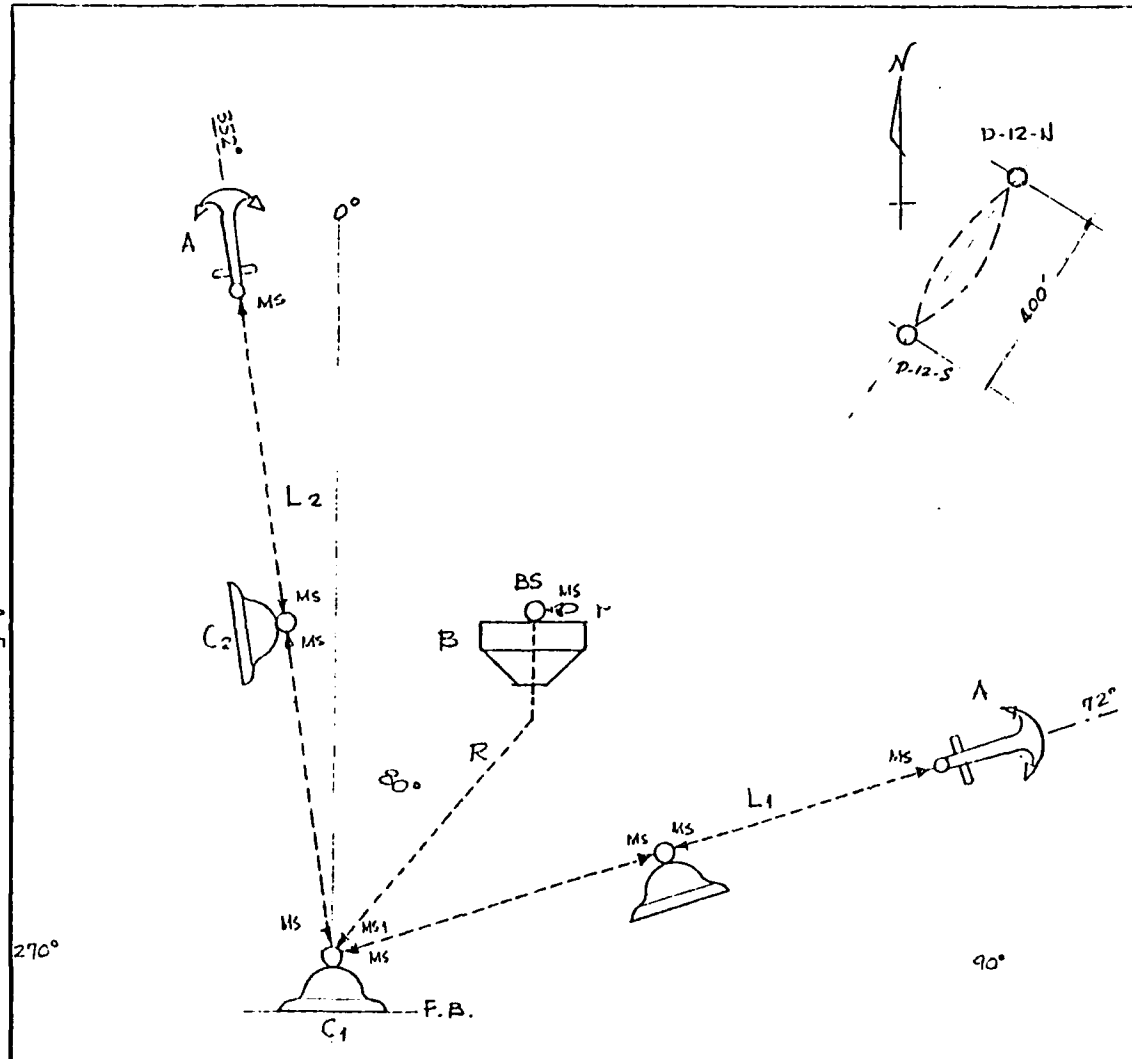
WATER DEPTH: 40' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility 4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											BUOY'S FIBERGLASS COATING IS
SHACKLE 4½"											CHIPPED. HEAVY MARINE GROWTH
SHACKLE 4¾"											BELOW WATER LINE. TOP HARDWARE
RISER CHAIN											IS MODERATELY RUSTED AND THE
											CHAFING RAIL IS DENTED. SMALLEST
RISER	NEAR BUOY		3"				√√√			10'	RISER DOUBLE LINK MEASUREMENT WAS
	MIDDLE		↓				√√√			20'	5⅞" (92.9%)
	NEAR GRD RG		↓				√√√			40'	RISER ENTERS BOTTOM AT 40'
GROUND RING											
GROUND LEG NO. A	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

TWO LEGS

DATE: 4 MAY 83 ENGINEER IN CHARGE: T. JONES DIVERS: _____



D - 12 - N

LOCATION: E 139° 39' 29"
N 35° 19' 41½"

ELEV FIRN EDITION 42'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY	
BUOY	B	12 WT			1	
RISER CHAIN	R		3"	62'	1	
LEG CHAIN	L1		2½"	182'	1	
	L2		2½"	186'	1	
ANCHOR	A	6 T			2	
SINKER (CLUMP)	C1	8T			1	
	C2	4 T			2	
BUOY SHACKLE	BS		4¼"		1	
MOORING SHACKLE	MS1		4¼"		1	
	MS2		4"		2	
	MS3		3½"		2	
	MS4		3¼"		3	
	MS5		3"		2	
JOINING SHACKLE						
RING	r		3½"		1	

FIGURE A-1. MOORING D12N SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D12S

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The top deck plate, top hardware and hawsepipe are all badly rusted. The buoy is fiberglass coated and has two rubber fenders.

Riser

One double link measurement near the mud line was between 80 and 90 percent of the chain's original 3-inch diameter. About 15 feet of rusty riser chain snakes on the bottom before being attached to a cast steel sinker by a 4 1/2- inch shackle. The smallest double link measurement obtained was 5 1/4 inches (87.5 percent).

Ground Legs

The upper sections of two ground legs were visible. Leg A was measured and found to have a wire diameter of 2 1/2 inches. This leg and Leg B (which had a single link measurement of 2 5/16 inches) are connected to a cast steel sinker with 4 1/2-inch shackles. A fourth shackle is also attached to the hairpin of the sinker.

Sinker/Anchors

Not visible for inspection.

Recommendation

This mooring is in fair condition.

As-built information contained in Figure A-2 reveals that the legs of this mooring were 2 1/2-inch wire diameter when installed. A class A mooring requires ground legs of 2 3/4-inch diameter. Therefore, recommend that this mooring be reclassified from a class A to a class B mooring.

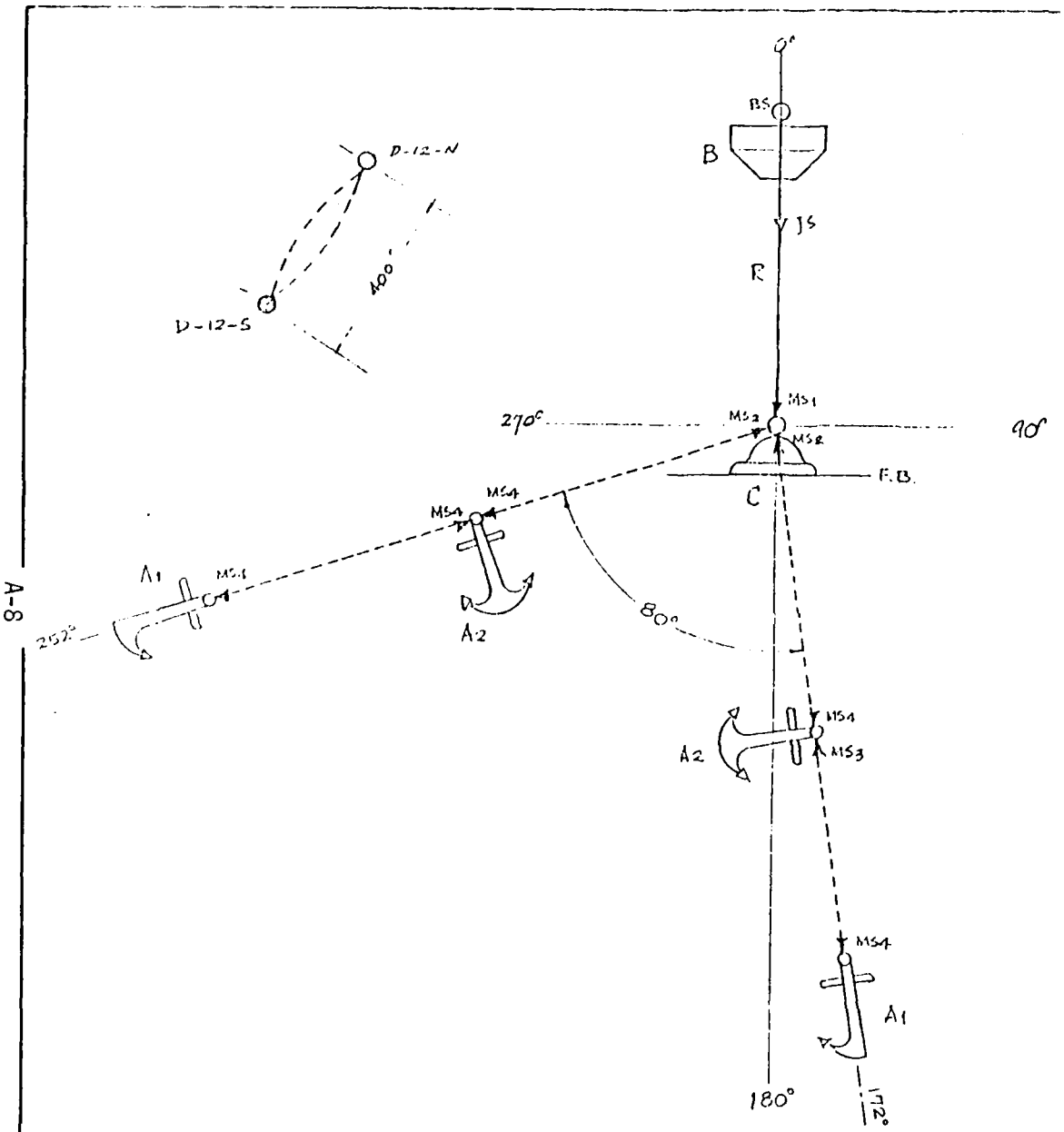
MOORING NO.: D12S CLASS: A LOCATION: YOKOSUKA LAT: 139°39'35" LONG: 35°17'44"

WATER DEPTH: 30' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility 4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION: NEW	SINGLE LINK % 90+	SINGLE LINK % 80+	SINGLE LINK % 80-	DOUBLE LINK % 90+	DOUBLE LINK % 80+	DOUBLE LINK % 80-	D	COMMENT
BUOY HARDWARE											TOP DECK PLATE / TOP HARDWARE
2 3/4" SHACKLE											HAWSEPIPE BADLY RUSTED.
4 1/4" SHACKLE											FIBERGLASS COATING / RUBBER
RISER CHAIN											FENDERS OK.
RISER	NEAR BUOY		3"				✓✓✓			10'	5 7/8" D.L.
	MIDDLE		↓				✓✓✓			15'	5 3/4" D.L.
	NEAR GRD RG		↓				✓✓	✓		30'	5 1/4" D.L. (87%). FIFTEEN FEET
GROUND RING											OF RUSTY RISER ON BOTTOM CONNECTED
BRNG GROUND LEG NO. A 105°	UPPER END	TWO LEGS	2½"	✓✓						30'	TO A SINKER WITH A 4½" SHACKLE.
	MIDDLE										TWO LEGS VISIBLE. ONE " ENTERS
	ENTERS BOTTOM										BOTTOM 5' FROM SINKER. SECOND
BRNG GROUND LEG NO. B 230°	UPPER END		2½"	✓✓						30'	2 5/16" ENTERS BOTTOM 16' FROM
	MIDDLE										SINKER.
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										ANCHORS NOT VISIBLE
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 4 MAY 1983 ENGINEER IN CHARGE: T. JONES DIVERS: MILLER HARDING



D - 12 - S

LOCATION: E 131° 39' 26¼'
N 35° 17' 36"

DEV
APPROACH 42'

MOORING COMPONENTS

ITEM	SYMBOL	JOINING	WIRE SIZE	LENGTH	Q'TY	
BUOY	B	B WITH			1	
RISER CHAIN	R		3"	62'	1	
LEG CHAIN	L1		2½"	180'	1	
	L2		2½"	181'	1	
ANCHOR	A1	6T			2	
	A2	4T			2	
SINKER (CLUMP)	C	8T			1	
BUOY SHACKLE	BS		4"		1	
MOORING SHACKLE	MS1		4¼"		1	
	MS2		3¾"		2	
	MS3		3¼"		1	
	MS4		3"		5	
JOINING SHACKLE	J6		5¼"		1	

FIGURE A-2. MOORING D12S SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D2N

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated. There is some light rusting of the top deck plate under the fiberglass and a medium amount of rust streaking of the side plating. The galvanized pipe chafing rail is rusted and flaking badly. A heavy coating of marine growth covers the buoy bottom below the water line.

Riser

The riser consists of 3 1/2-inch chain. However, double link measurements of the lower half of this chain were between 80 and 90 percent of its original wire diameter. The riser enters the bottom at a depth of 60 feet.

Ground Legs/Sinker/Anchors

Not visible for inspection.

Recommendation

This mooring is in fair condition.

The worn condition of the riser chain of this mooring would dictate that this mooring be downgraded to a class A mooring. The ground leg diameters of 2 3/4 inches (Figure A-3) are also satisfactory for a class A mooring. However, this is part of a bow/stern mooring system and its classification should not exceed that of its sister mooring. Since mooring D2S can meet only the requirements of a class C mooring, recommend that this mooring be reclassified to a class C mooring.

MOORING NO.: D2N CLASS: CC LOCATION: YOKOSUKA LAT: 139°-37'-35" LONG: 35°-17'-44"

WATER DEPTH: 60' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSE PIPE

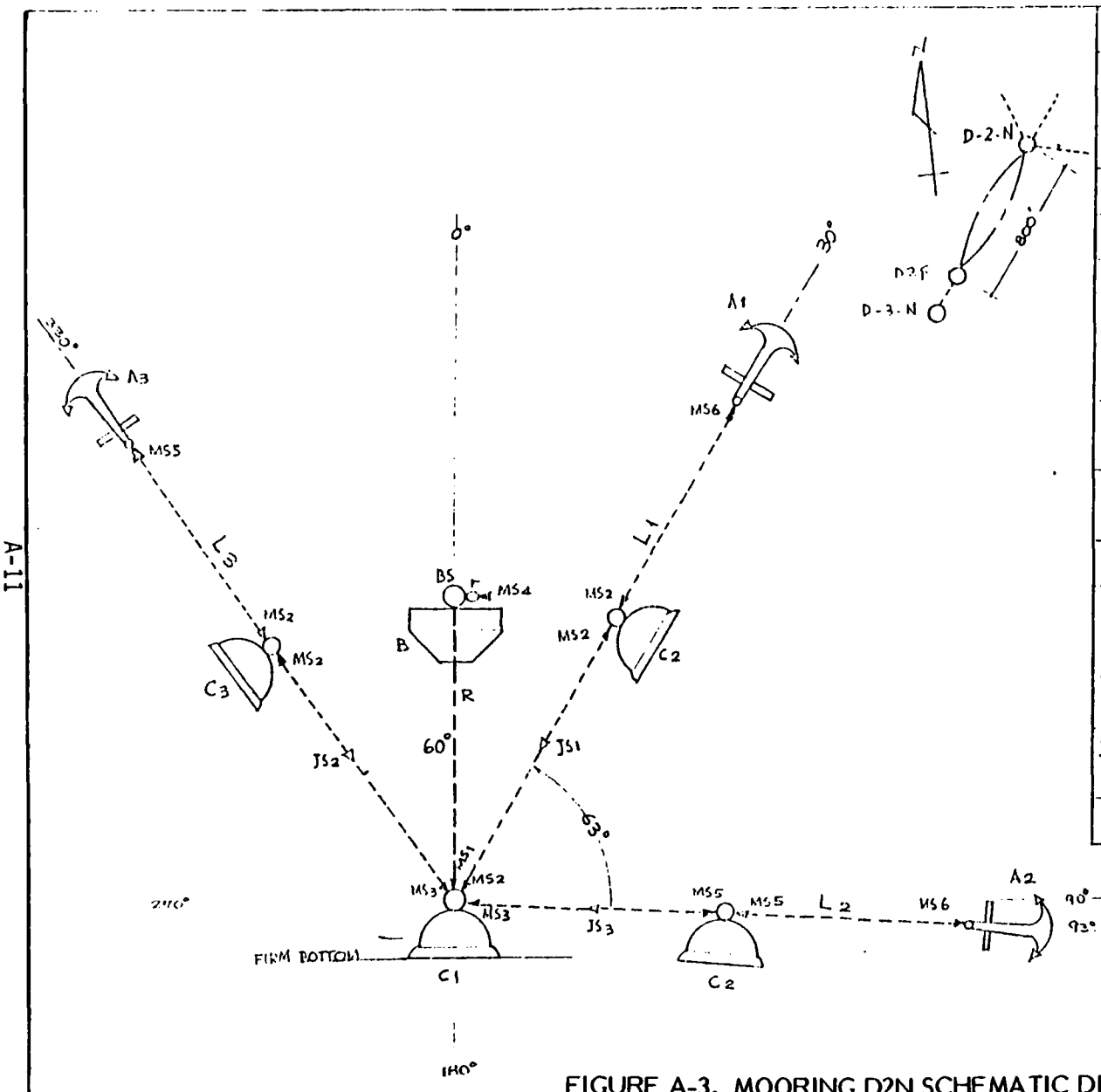
BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~ 4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS COATED BUOY, LIGHT
3½" END LINK											RUSTING OF TOP DECK UNDER
3½" SHACKLE											FIBERGLASS AND ROST STREAKING
5½" SHACKLE											OF SIDES. CHAFING RAIL RUSTING/
RISER CHAIN											FLAKING. BUOY HULL OK. HEAVY
RISER	NEAR BUOY		3½"				√√√			10'	MARINE GROWTH.
	MIDDLE		↓				√√	√		25'	
	NEAR GRD RG		↓					√√√		60'	
GROUND RING											
GROUND LEG NO. A	UPPER END										SINKER VISIBLE AT BOTTOM
	MIDDLE										OF 10' CRATER IN MUD.
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

THREE LEGS ↓

DATE: 4 MAY 83 ENGINEER-IN-CHARGE: JONES DIVERS: LITTLE/SHUERIN

CHESNAVFACENGCOM REPORT FPO-1-83(25), "PWC YOKOSUKA FLEET MOORINGS INSPECTION REPORT".



D - 2 - N						
LOCATION: L 139° 39' 35" N 35° 17' 44"				ELEV FIRM BOTTOM	46'	
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY	
BUOY	B	18 WPT			1	
RISER CHAIN	R		3½"	67'	1	
LEG CHAIN	L 1		3"+2¾"	195' (120'+75')	1	
	L 2		3"+2¾"	220' (145'+75')	1	
	L 3		3"+2¾"	210' (135'+75')	1	
ANCHOR	A 1	10 T			1	
	A 2	8 T			1	
	A 3	6 T			1	
SINKER (CLUMP)	C 1	10 T			1	
	C 2	8 T			2	
	C 3	6 T			1	
BUOY SHACKLE	BS		5¼"		1	
MOORING SHACKLE	MS1		5"		1	
	MS2		4½"		5	
	MS3		4¼"		2	
	MS4		4"		1	
	MS5		3¾"		3	
	MS6		3½"		2	
JOINING SHACKLE	JS 1		4"		1	
	JS 2		3⅞"		1	
	JS 3		3½"		1	
RING	R		4¼"		1	

FIGURE A-3. MOORING D2N SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D2S

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated, but there is some rusting of the metal hull beneath the fiberglass. There is some green paint near the buoy's water line. Standard paint is black or white.

Riser

The riser was originally 3 1/2-inch chain which is now worn to between 80 and 90 percent of that figure near the mud line. The riser enters the bottom at a depth of 46 feet.

Ground Legs/Sinker/Anchors

Although buried in the bottom, the divers were able to feel the top of the sinker and the top links of the three legs attached to it.

Recommendation

This mooring is in fair condition.

The worn condition of the riser chain indicates that this mooring should be downgraded from a class CC to a class A mooring. However, as-built information contained in Figure A-4 reveals that the legs of this mooring were 2 1/4-inch wire diameter when installed. A class A mooring requires ground legs of 2 3/4-inch diameter. Therefore, recommend that this mooring be reclassfied from a class CC to a class C mooring.

MOORING NO.: D25 CLASS: CC LOCATION: YOKOSUKA LAT: 139°-39'-30.25" LONG: 35°-17'-27.25"

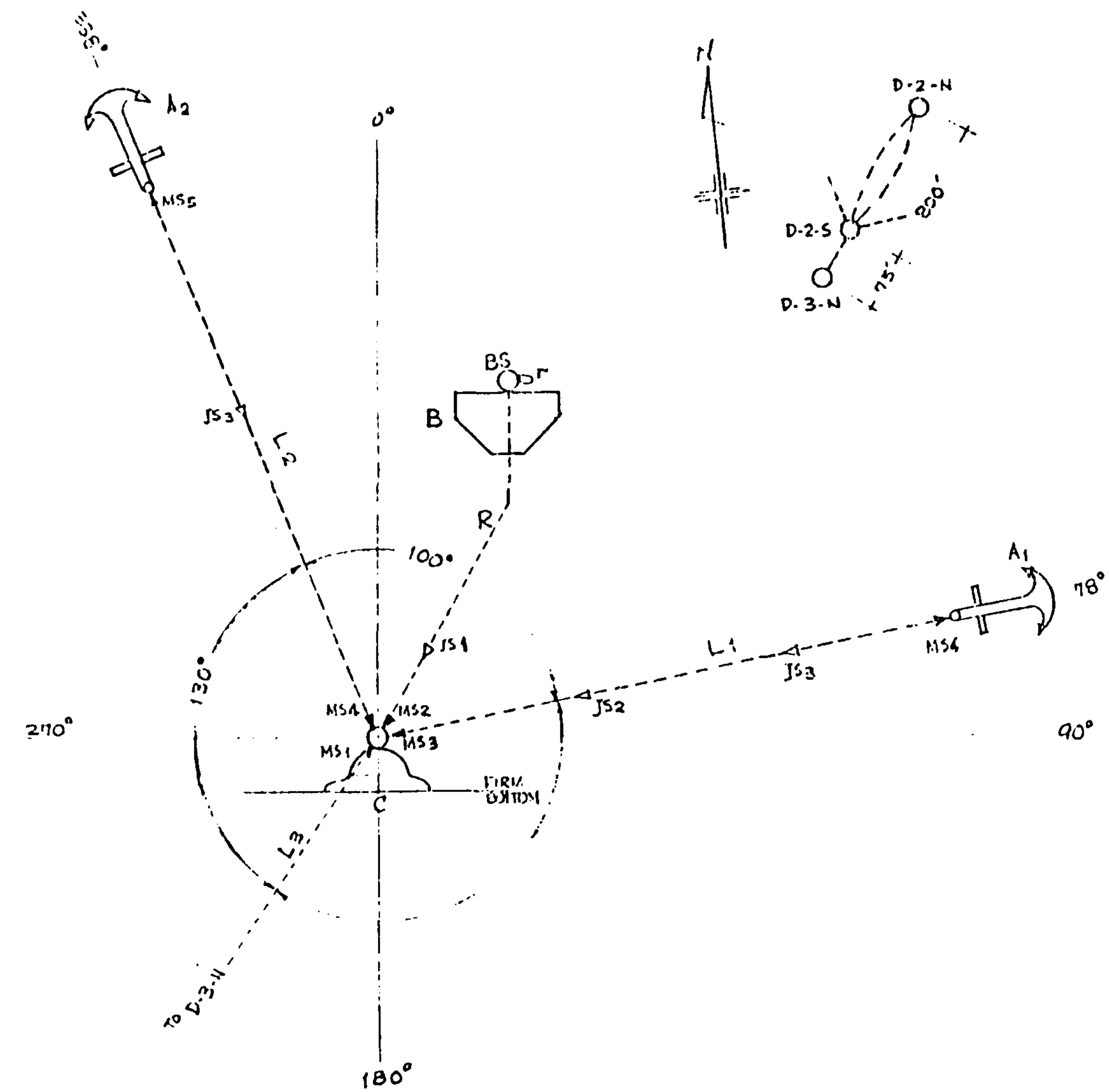
WATER DEPTH: 46' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~ 4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION: NEW	SINGLE LINK % 90+	SINGLE LINK % 80+	SINGLE LINK % 80-	DOUBLE LINK % 90+	DOUBLE LINK % 80+	DOUBLE LINK % 80-	D	COMMENT
BUOY HARDWARE											RUST UNDER FIBERGLASS
											GREEN PAINT NEAR WATERLINE
RISER	NEAR BUOY		3½"				√√√			10'	DIVER COULD FEEL TOP OF SINKER
	MIDDLE		↓				√√√			20'	BURIED IN MUD BOTTOM. THREE
	NEAR GRD RG		↓					√√√		46'	LEGS AND A RISER ARE
GROUND RING											SHACKLED TO A 3¼" HAIRPIN.
GROUND LEG NO. A	UPPER END										NEAR BOTTOM, RISER MEASURED
	MIDDLE										BETWEEN 80 AND 90 PERCENT.
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM	↓									
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 5 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: HARDING/SAKO

CHESNAVFACENGCOM REPORT FPO-1-83(25), "PWC YOKOSUKA FLEET MOORINGS INSPECTION REPORT".



D - 2 - S					
LOCATION: E 139° 39' 30"¼ N 35° 17' 27"¾				ELEV FIRM BOTTOM	47'
MOORING COMPONENTS					
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	12 WDT			1
RISER CHAIN	R		3½"	67'	1
LEG CHAIN	L1		2½"	225' (75' × 3)	1
	L2		2⅞"+2¼"	180' (90' + 90')	1
	L3		3½"	75'	1
ANCHOR	A1	8T			1
	A2	6T			1
SINKER (CLUMP)	C	8T			1
BUOY SHACKLE	BS		5"		1
MOORING SHACKLE	MS1		4⅞"		1
	MS2		4¼"		1
	MS3		3⅞"		1
	MS4		3½"		2
	MS5		2⅞"		1
JOINING SHACKLE	JS1		4¼"		1
	JS2		3⅞"		1
	JS3		2⅞"		2
RING	r		3⅛"		1

FIGURE A-4. MOORING D2S SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D3N

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy has a 12-foot diameter and is fiberglass coated. The hull of the buoy under the fiberglass is both dented and rusted. The buoy identification numbers need to be repainted and the chafing rail is badly rusted.

Riser

The riser consists of 3 1/2- and 3 1/4-inch chain. All measurements were greater than 90 percent. The upper section of the riser is covered with heavy marine growth and vertically enters the bottom at a water depth of 42 feet.

Ground Legs/Anchors/Sinker

Not visible for inspection.

Recommendation

This mooring is in fair condition.

As-built information contained in Figure A-5 reveals that the legs of this mooring were 2 1/2-inch wire diameter when installed. A class B mooring requires ground legs of 2 1/2-inch diameter. Therefore, recommend that this mooring be reclassified from a class CC to a class B mooring.

MOORING NO.: D 3 N CLASS: CC LOCATION: YOKOSUKA LAT: 139°-39'-30" LONG: 35°-17'-37"

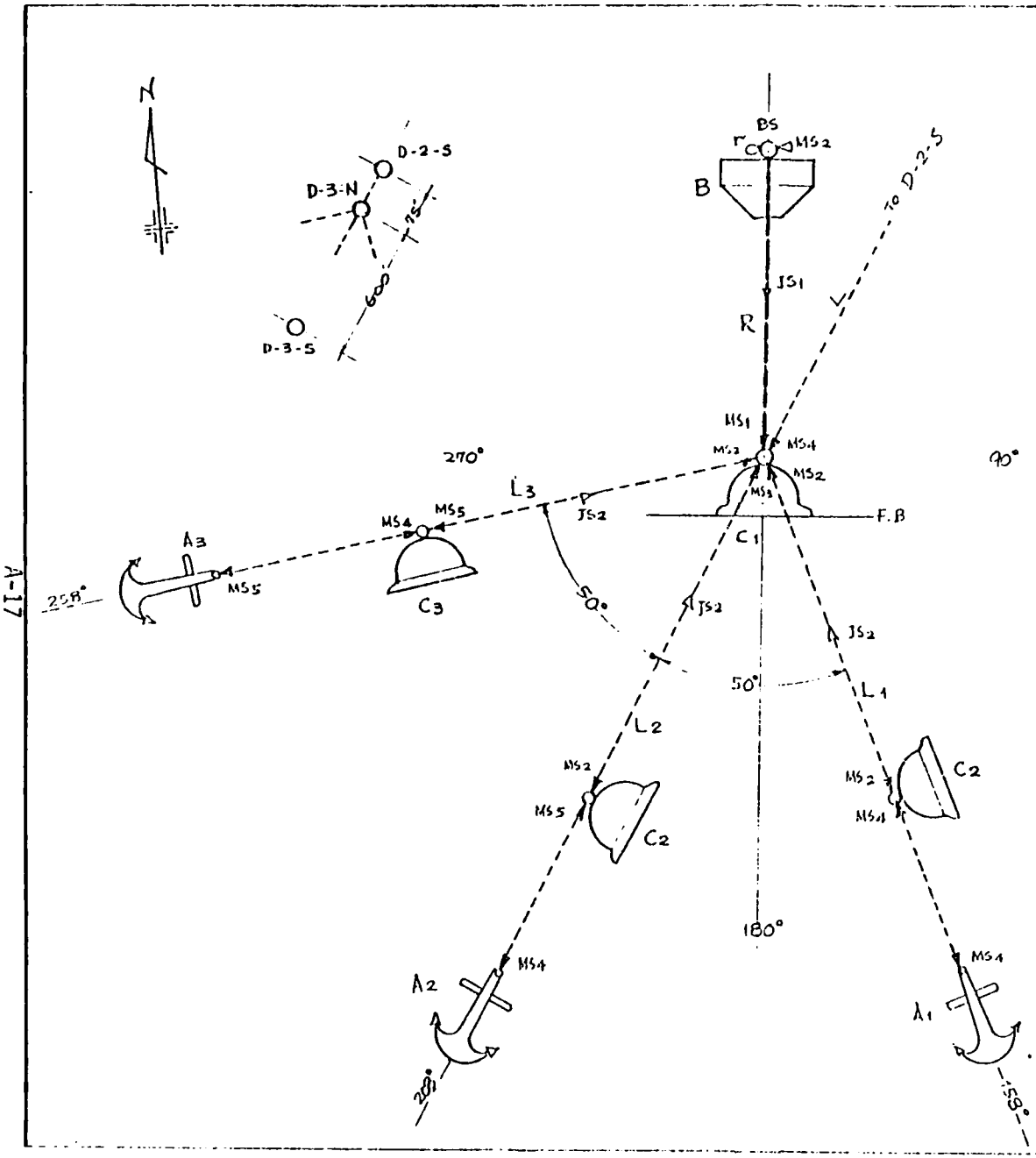
WATER DEPTH: 42' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/ HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~ 4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											DENTED CAN AND RUSTED RAIL AND
5" SHACKLE											CAN. NUMBERS IN NEED OF
5 1/2" SHACKLE											PAINTING. FIBERGLASS OK. BUOY
RISER CHAIN											HAS 12' DIAMETER
RISER	NEAR BUOY		3 1/2"				√√√			10'	HEAVY GROWTH ON RISER
	MIDDLE		↓				√√√			30'	
	NEAR GRD RG		↓				√√√			42'	ENTERS BOTTOM VERTICALLY
GROUND RING											
GROUND LEG NO. A	UPPER END										LEGS / ANCHORS / SINKER BURIED
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM	↓									
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 5 MAY 83 ENGINEER IN-CHARGE: JONES DIVERS: HARDING / SAKO

CHESNAVFACENGCOM REPORT FPO-1-83(25), "PWC YOKOSUKA FLEET MOORINGS INSPECTION REPORT".



D - 3 - N						
LOCATION: E 139° 34' 30" N 35° 17' 37"			ELEV FIRM BOTTOM 47'			
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH		Q'TY
BUOY	B	12 WDT				1
RISER CHAIN	R		3½"	60'	117'	1
			3¼"	17'		
LEG CHAIN	L1		2¼"	150'	225'	1
			2⅛"	75'		
	L2		2¾"	145'	220'	1
			2½"	75'		
	L3		2¼"	145'	220'	1
			2⅛"	75'		
ANCHOR	A1	10 T				1
	A2	8 T				1
	A3	6 T				1
SINKER (CLUMP)	C1	10 T				1
	C2	8 T				2
	C3	6 T				1
BUOY SHACKLE	BS		5"			1
MOORING SHACKLE	MS1		5"			1
	MS2		4"			5
	MS3		3⅞"			1
	MS4		3¾"			5
	MS5		3½"			4
JOINING SHACKLE	JS1		4¼"			1
	JS2		3½"			3
RING	R		3⅞"			1

FIGURE A-5. MOORING D3N SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D3S

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated but its sides have heavy rust bleeding. The pipe-type chafing rail is badly damaged.

Riser

The riser measured better than 90 percent of its original 3-inch wire diameter. The upper section of the riser chain is covered with moderate marine growth while the lower section is clean. About 8 feet of riser chain lies in a ball on the bottom before its bitter end is shackled to a cast steel sinker.

Ground Legs

About 5 feet of each of three ground legs were visible before the legs entered the bottom. Two of the legs were measured to be between 80 and 90 percent of their original wire diameters, while the third leg was measured to be greater than 90 percent. The fourth leg was not attached to the sinker.

Sinker/Anchors

Although part of the sinker was visible the anchors were buried.

Recommendation

This mooring is in poor condition.

Although Figure A-6 shows that mooring D3S is designed with four ground legs, only three were found to be connected to the sinker. Because this mooring is part of a cluster of moorings (see Figure 2), the missing leg could adversely affect the performance of moorings D3N, D4N and D4S as well. Recommend that the adequacy of this mooring

cluster be reviewed in view of a missing leg from mooring D3S. Until this review can be completed, recommend that this mooring system's usage be limited to absolutely necessary situations. In addition, a class CC mooring requires three double legs. This mooring consists of only four single legs. After the results of the above review are known and corrective maintenance actions are completed, this mooring should be reclassified to a class mooring commensurate with the wire sizes of its component mooring material.

MOORING NO.: D35 CLASS: CC LOCATION: YOKOSUKA LAT: 139°-39'-36.35" LONG: 35°-17'-31.25"

WATER DEPTH: 40' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility 4'-6' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS OK. RUST BLEEDING ON
4" SHACKLE											SIDES. CHAFING RAIL DAMAGED
4½" SHACKLE											
RISER CHAIN											
RISER	NEAR BUOY		3"				√√√			10'	MODERATE GROWTH
	MIDDLE		↓				√√√			22'	
	NEAR GRD RG		↓				√√√			40'	CLEAN CHAIN. EIGHT FOOT LONG BAL
GROUND RING											OF RISER CHAIN ON BOTTOM. 4½"
BRNG GROUND LEG NO. A N.E.	UPPER END		3"		√√√					46'	SHACKLE CONNECTS RISER TO THE
	MIDDLE										SWEEL. ONLY FIVE FEET OF THREE LEGS
	ENTERS BOTTOM										WERE OBSERVED BY THE DIVERS. THE
BRG GROUND LEG NO. B SE	UPPER END		3"		√√√					40'	FOURTH LEG WAS MISSING.
	MIDDLE										
	ENTERS BOTTOM										
BRNG GROUND LEG NO. C WEST	UPPER END		3"	√√√						40'	
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										MISSING
	MIDDLE										
	ENTERS BOTTOM										

DATE: 5 MAY 53 ENGINEER IN CHARGE: JONES DIVERS: HARDING/SAKO

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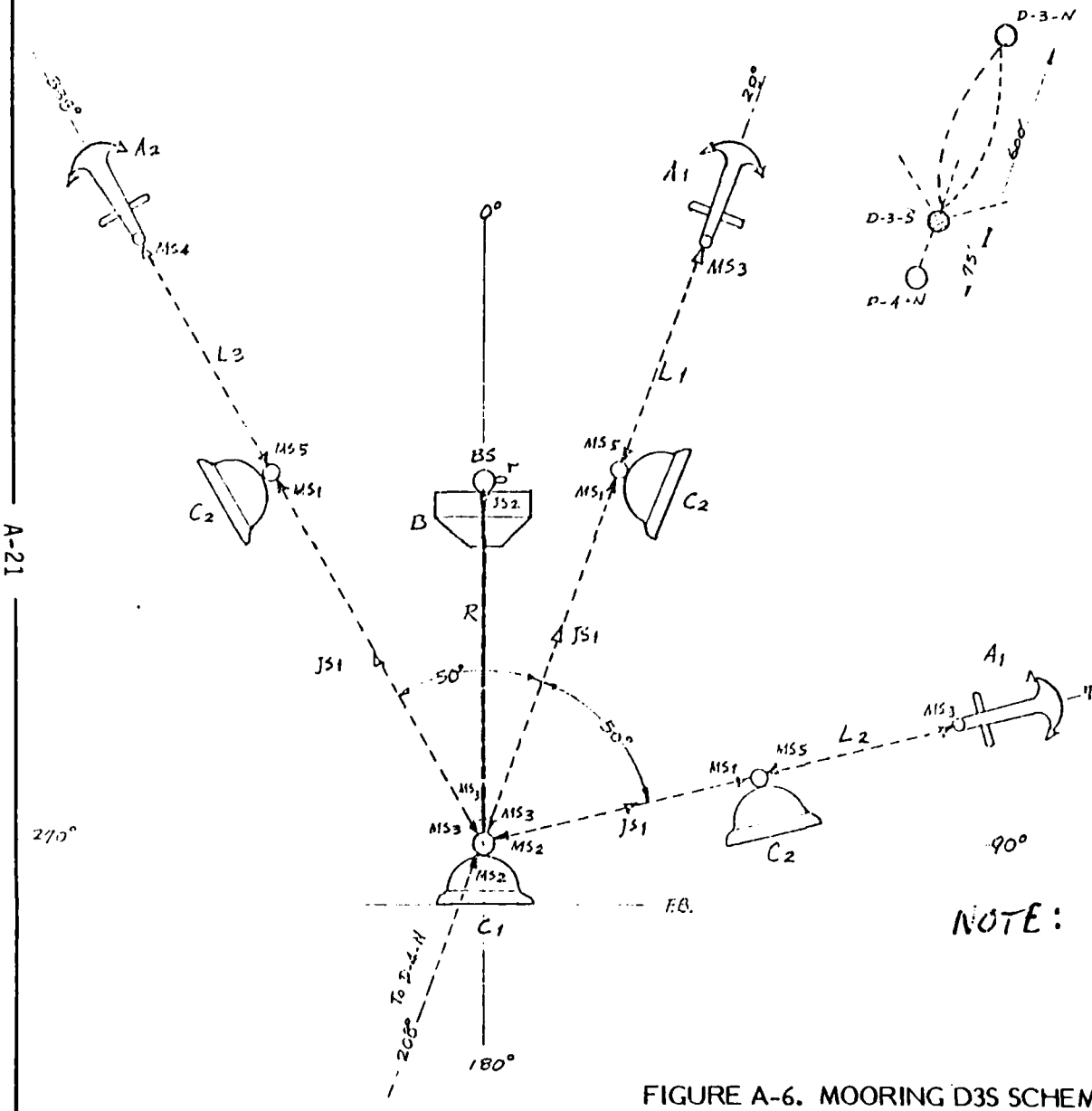


D - 3 - S

LOCATION: E 139° 39' 26¼" N 35° 17' 31¼"				ELEV FIRM BOTTOM 40'		
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY	
BUOY	B	12 WDT			1	
RISER CHAIN	R		3"	62'	1	
LEG CHAIN	L1		3"	110' 75' 185'	1	
			3"			
	L2		3"	125' 75' 200'	1	
			3"			
	L3		3"	110' 75' 185'	1	
			2⅞"			
ANCHOR	A1	10T			2	
	A2	8T			1	
SINKER (CLUMP)	C1	10T			1	
	C2	6T			3	
BUOY SHACKLE	BS		4½"		1	
MOORING SHACKLE	MS1		4½"		3	
	MS2		4¼"		2	
	MS3		4⅛"		2	
	MS4		4"		4	
	MS5		3¾"		3	
JOINING SHACKLE	JS1		3¼"		3	
	JS2		3⅛"		1	
RING	r		2¾"		1	

NOTE: DIVERS FOUND ONLY THREE LEGS (MAY 1983)

FIGURE A-6. MOORING D3S SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D4N

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated, but there is some evidence of rusting of the metal hull under this coating. Overall, this buoy is in good condition.

Riser

The riser chain was originally 3 1/2-inch wire diameter. All measurements taken were greater than 90 percent of the initial diameter. The riser chain vertically enters the bottom at a water depth of 38 feet.

Ground Legs/Sinker/Anchors

Not visible for inspection.

Recommendation

This mooring is in good condition.

As-built information contained in Figure A-7 reveals that, when installed, the wire sizes of the ground legs met the requirements for a class C mooring, since one leg contains only 2 1/4-inch chain. Recommend this mooring be reclassified from a class CC mooring to a class C mooring.

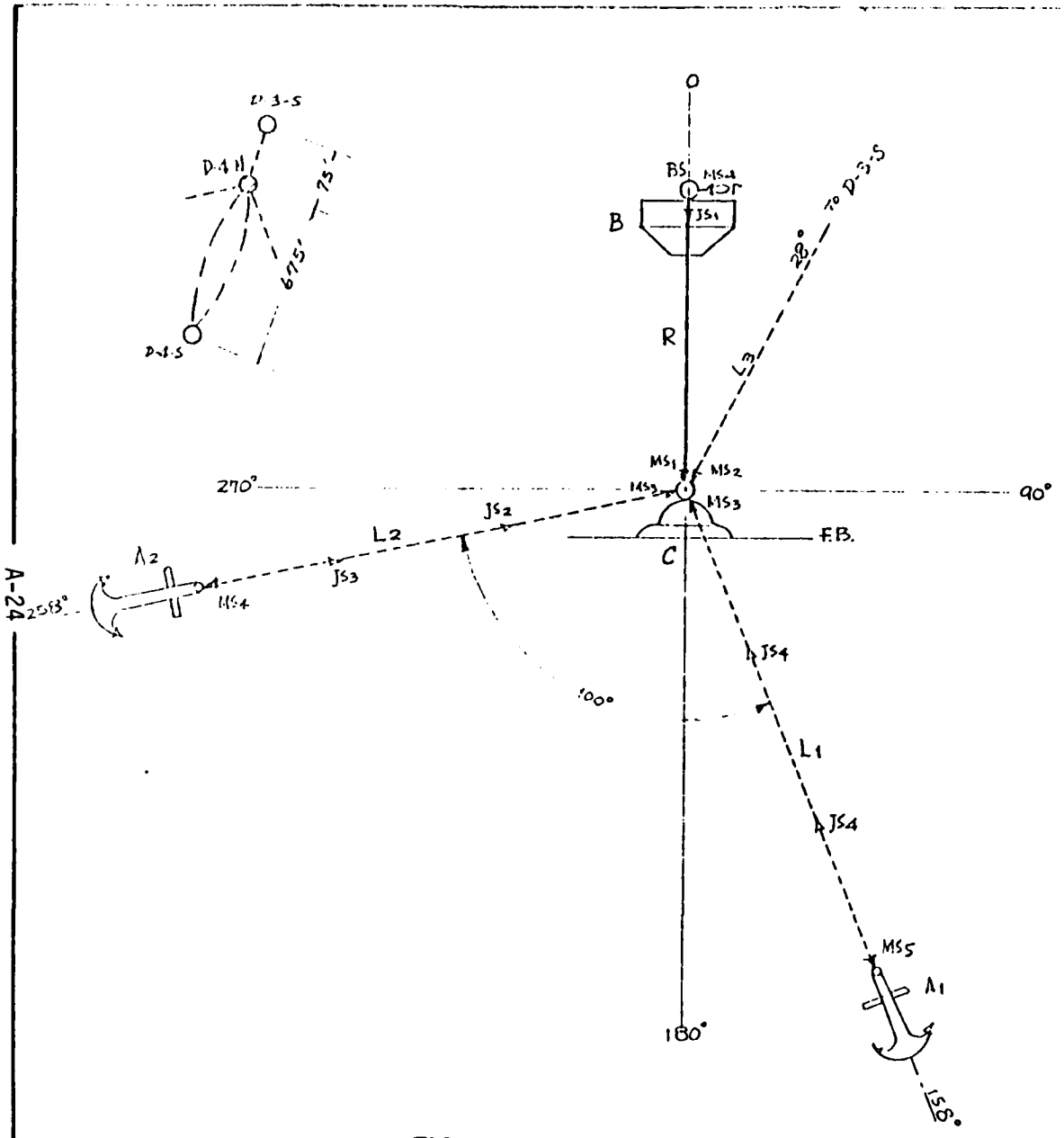
MOORING NO.: D4N CLASS: CC LOCATION: YOKOSUKA LAT: 139°-37'-25.5" LONG: 35°-17'-30.5"

WATER DEPTH: 38' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSE PIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE		✓									FIBERGLASSED BUOY. SOME RUSTING OF HULL UNDER THE FIBERGLASS. GOOD CONDITION.
RISER	NEAR BUOY		3½'				✓✓			10'	
	MIDDLE		↓				✓✓			25'	
	NEAR GRD RG		↓				✓✓			38'	ENTERS MUD VERTICALLY
GROUND RING											
GROUND LEG NO. A	UPPER END										
	MIDDLE										CLUMP/GROUND LEGS/ANCHORS
	ENTERS BOTTOM										NOT VISIBLE
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM	↓									
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 3 MAY 1983 ENGINEER IN CHARGE: JONES DIVERS: _____



D - 4 - N

LOCATION: E 134° 31' 25¾"
N 35° 17' 30½"

ELEV FIRM BOTTOM 39'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	18 WDT			1
RISER CHAIN	R		3½"	62'	1
LEG CHAIN	L1		2½" 2¼"	120' 45' 195'	1
	L2		2¾" 2½"	120' 80' 200'	1
	L3		3½"	75'	1
ANCHOR	A1	8T			1
	A2	6T			1
SINKER (CLUMP)	C	15T			1
BUOY SHACKLE	BS		6"		1
MOORING SHACKLE	MS1		4 7/8"		1
	MS2		4 ¼"		1
	MS3		4"		2
	MS4		3 7/8"		2
	MS5		3¼"		1
JOINING SHACKLE	JS1		4"		1
	JS2		3¼"		1
	JS3		3⅛"		1
	JS4		3"		2
RING	R		4¼"		1

FIGURE A-7. MOORING D4N SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D4S

Buoy

This is a large Japanese-built drum-type buoy with a hawsepipe. The buoy's fiberglass coating and fenders are in good condition. The buoy's identification number needs to be repainted. The top jewelry is badly rusted.

Riser

The riser was originally 3 1/2-inch chain and still measures greater than 90 percent of that size. The riser enters the bottom at a water depth of 33 feet.

Ground Legs/Sinkers/Anchors

Not visible for inspection.

Recommendation

This mooring is in good condition.

As-built information contained in Figure A-8 reveals that the ground legs of this mooring were 2 7/8-inch diameter when installed. This would dictate that the mooring is satisfactory for utilization as a class A mooring (2 3/4-inch diameter). However, this is part of a bow/stern mooring system and its classification should not exceed that of its sister mooring. Since mooring D4N can meet only the requirements of a class C mooring, recommend that this mooring be reclassified to a class C mooring.

MOORING NO.: D4S CLASS: CC LOCATION: YOKOSUKA LAT 139°-39'-22" LONG: 35°-17'-24.5"

WATER DEPTH: 33' ANCHOR SIZE/TYPE: NI BUOY TYPE: DROM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION							COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS COATED. FENDERS
4" END LINK											GOOD CONDITION. IDENTIFICATION
4½" SHACKLE											NUMBER NEEDS REPAINTING. TOP
6" SHACKLE											JEWELRY BADLY RUSTED.
RISER CHAIN											
RISER	NEAR BUOY		3½"				VVV			5'	
	MIDDLE						VVV			15'	
	NEAR GRD RG						VVV			33'	ENTERS BOTTOM
GROUND RING											
GROUND LEG NO. A	UPPER END										
	MIDDLE										GROUND LEGS/SINKER/ANCHORS
	ENTERS BOTTOM										BURIED.
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 4 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: LITTLE/SCHEUREN

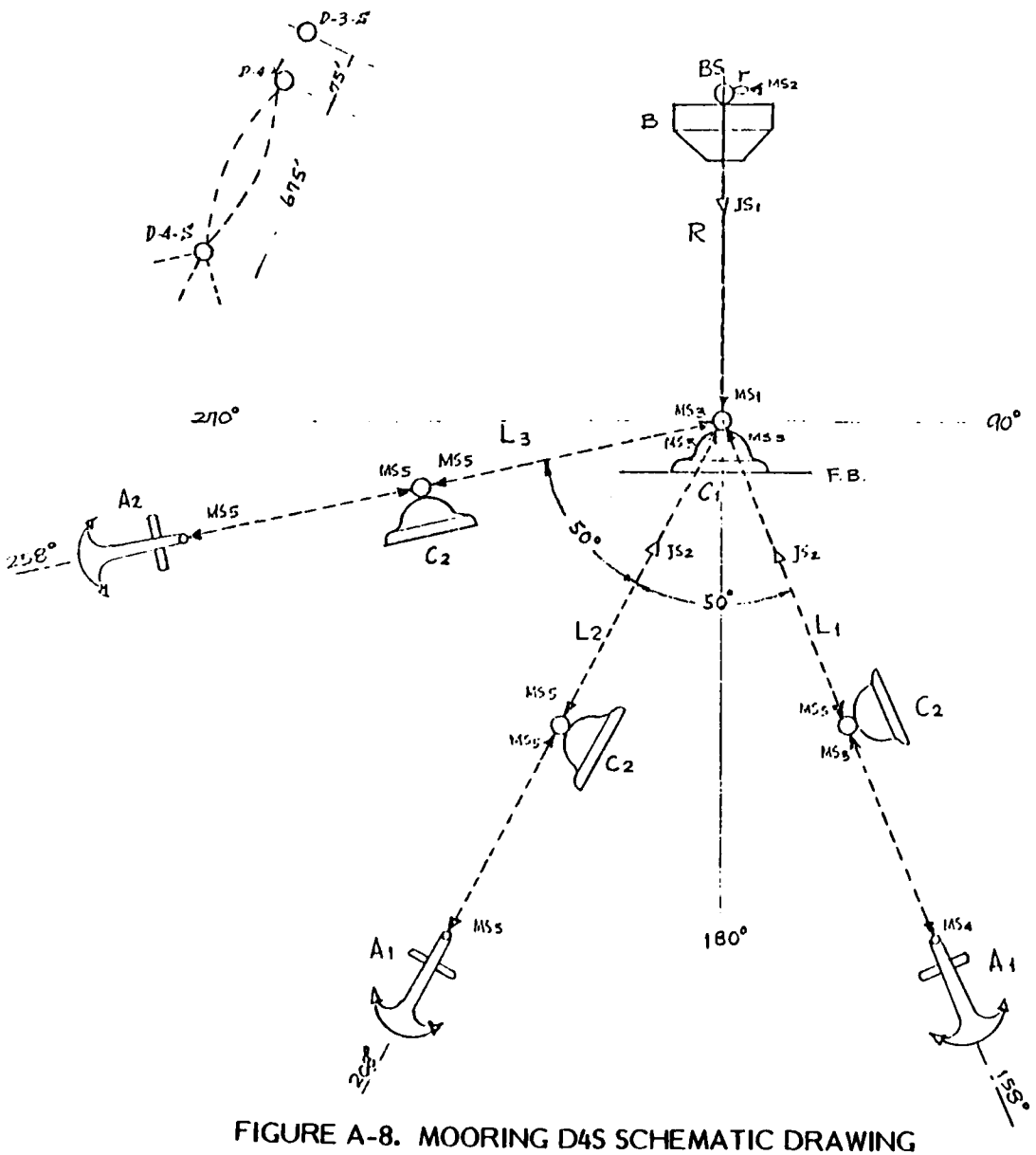


FIGURE A-8. MOORING D4S SCHEMATIC DRAWING

D - 4 - S

LOCATION: E 139° 39' 22"
N 35° 17' 21½"

ELEV FIRM BOTTOM 37'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	18 WDT			1
RISER CHAIN	R		3½"	62'	1
LEG CHAIN	L1		3" 2⅞"	120' 115' 195'	1
	L2		3" 2⅞"	190'	1
	L3		3"	171'	1
ANCHOR	A1	10 T			2
	A2	8 T			1
SINKER (CLUMP)	C1	10 T			1
	C2	6 T			3
BUOY SHACKLE	BS		6"		1
MOORING SHACKLE	MS1		5"		1
	MS2		4¼"		1
	MS3		4"		3
	MS4		3⅞"		1
	MS5		3¾"		8
JOINING SHACKLE	JS1		4"		1
	JS2		3¾"		2
RING	r		4¼"		1

INSPECTION RESULTS
MOORING D5N

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and has two rubber fenders. The top deck is covered with moderate rust, and the chafing rail is rusted through.

Riser

The riser chain was originally 2 3/4 inches and is worn to between 80 and 90 percent of this value. The upper section is covered with a heavy marine growth while the lower section is clean. About 20 feet of riser chain lies on the bottom before disappearing into the mud.

Ground Legs/Sinker/Anchors

Not visible for inspection.

Recommendation

This mooring is in fair condition.

As-built information contained in Figure A-9 reveals that the minimum wire diameter of one leg was only 2 inches when installed. Therefore, recommend that this mooring be reclassified to a class D mooring.

REPORT FPO-1-83(25)

MOORING NO.: D5N CLASS: CC LOCATION: YOKOSUKA LAT: 139°-37'-14"E LONG: 35°-17'-19"N

WATER DEPTH: 30' ANCHOR SIZE/TYPE: NJ BUOY TYPE: DRUM W/HAWSEPIPE

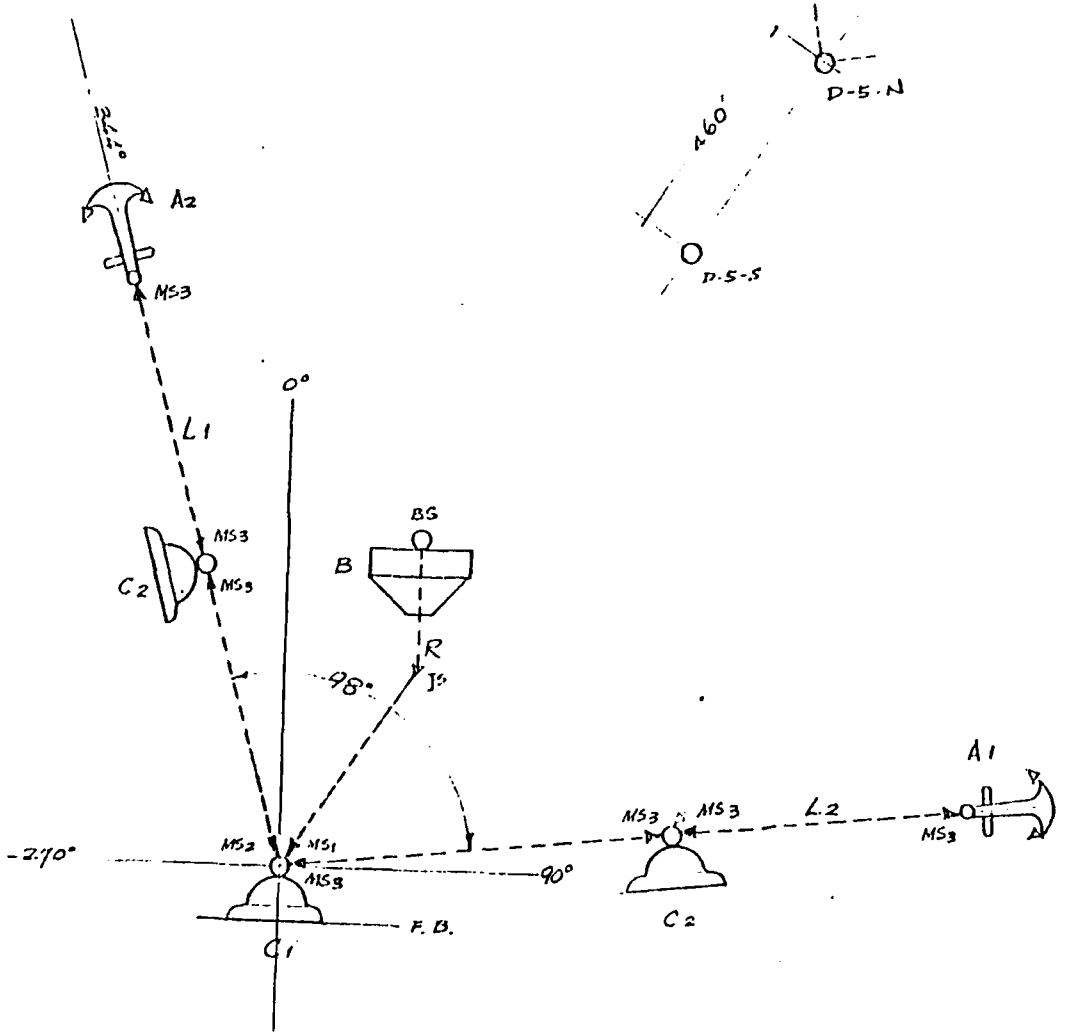
BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION NEW	SINGLE LINK % 90+	SINGLE LINK % 80+	SINGLE LINK % 80-	DOUBLE LINK % 90+	DOUBLE LINK % 80+	DOUBLE LINK % 80-	D	COMMENT
BUOY HARDWARE											RUBBER FENDERS GOOD CONDITION.
3¾" SHACKLE											CHAFING RAIL RUSTED THROUGH
RISER CHAIN											AND PAINTED OVER. MODERATE
											RUST ON TOP DECK.
RISER	NEAR BUOY		2¾"					VVV		15'	HEAVY MARINEGROWTH
	MIDDLE		↓					VVV		23'	
	NEAR GRD RG		↓					VVV		30'	CHAIN CLEAN. ABOUT 20' OF RISER
GROUND RING											CHAIN ON BOTTOM.
GROUND LEG NO. A	UPPER END										
	MIDDLE										SINKER/GROUND LEGS/ANCHORS
	ENTERS BOTTOM										NOT VISIBLE
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

TWO LEGS

A-29

DATE: 3 MAY 1983 ENGINEER IN CHARGE: JONES DIVERS:



D - 5 - N						
LOCATION: E 139° 37' 14" N 35° 17' 19"			ELEV FROM BOTTOM		30'	
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY	
BUOY	B	6 WPT			1	
RISER CHAIN	R		2¾"	51'	1	
LEG CHAIN	L1		2¼"	180'	1	
	L2		2¼"	90'	1	
			2"	75'		
ANCHOR	A1	8T			1	
	A2	6T			1	
SINKER (CLUMP)	C1	8T			1	
	C2	6T			2	
BUOY SHACKLE	BS		3¾"		1	
MOORING SHACKLE	MS1		4"		1	
	MS2		3¼"		1	
	MS3		3"		7	
JOINING SHACKLE	JS		3¼"		1	

FIGURE A-9. MOORING D5N SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING D5S

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and has two rubber fenders in good condition. The top plate, top jewelry, and hawsepipe are moderately rusted.

Riser

The upper section of the riser chain is covered with a heavy layer of marine growth while the lower section is clean. Although the upper chain was measured to be greater than 90 percent of its original wire diameter (2 3/4 inches), measurements obtained near the mud line were between 80 and 90 percent. The riser enters the bottom at a water depth of 30 feet.

Ground Legs/Sinker/Anchors

The ground legs and anchors are buried in the bottom. A portion of the sinker was visible about 4 feet from where the riser entered the bottom.

Recommendation

This mooring is in fair condition.

As-built information contained in Figure A-10 reveals that the ground legs of this mooring were 2 1/4-inch diameter when installed. This would dictate that the mooring is satisfactory for utilization as a class C mooring (2 1/4-inch diameter). However, this is part of a bow/stern mooring system and its classification should not exceed that of its sister mooring. Since mooring D5N can meet only the requirements of a class D mooring, recommend that this mooring to be reclassified to a class D mooring.

MOORING NO.: D58 CLASS: CC LOCATION: YOKOSUKA LAT 139°-39'-10.5" LONG: 35°-17'-15.2"

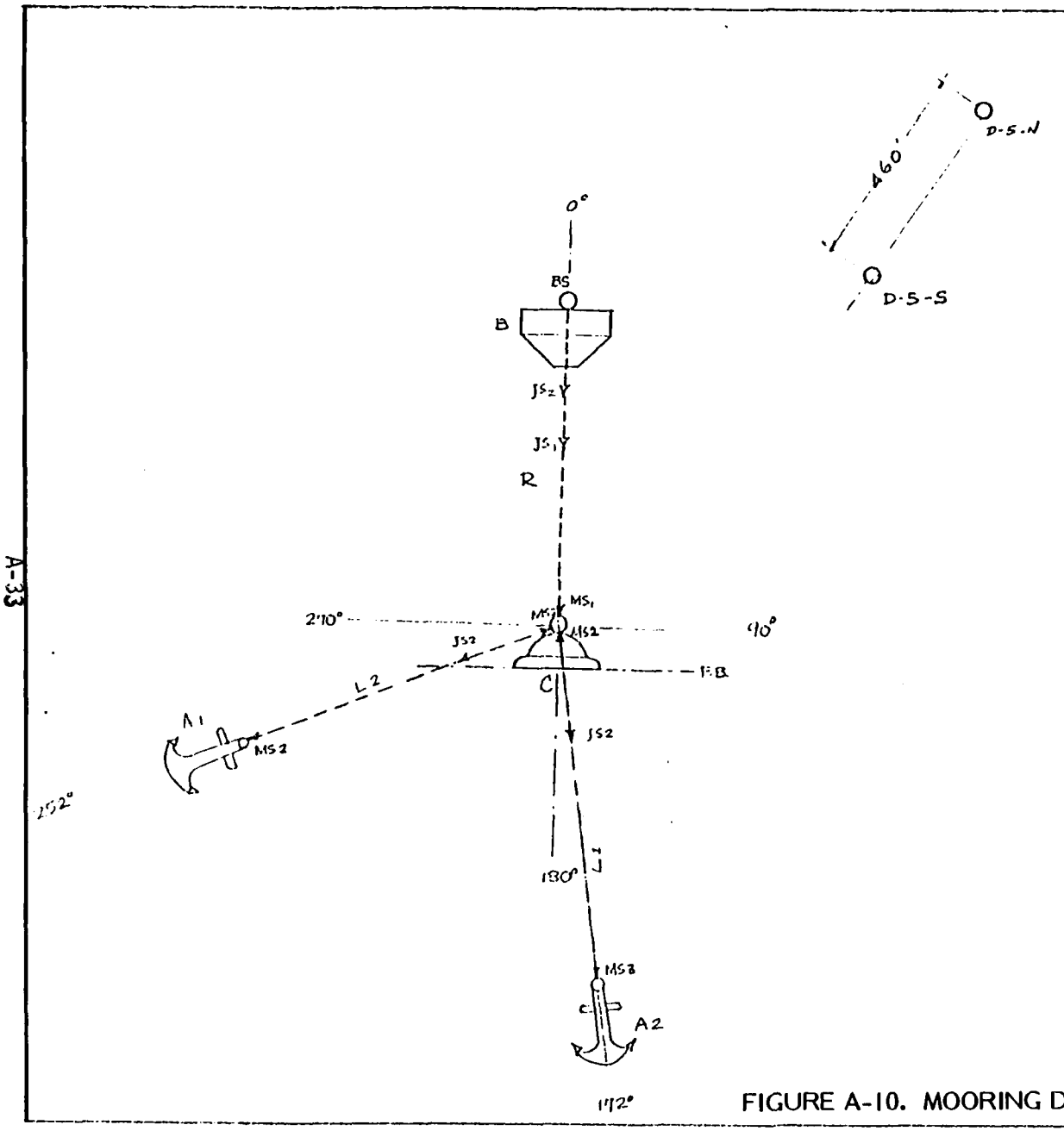
WATER DEPTH: 30' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION: NEW	SINGLE LINK % 90+	SINGLE LINK % 80+	SINGLE LINK % 80-	DOUBLE LINK % 90+	DOUBLE LINK % 80+	DOUBLE LINK % 80-	D	COMMENT
BUOY HARDWARE											TOP LIGHTLY RUSTED. GOOD
3 3/4" SHACKLE											FENDERS. HAWSE PIPE/TOP JEWELRY
RISER CHAIN											RUSTED. FIBERGLASS OK.
RISER	NEAR BUOY		2 3/4"				√√√			10'	HEAVY GROWTH
	MIDDLE						√√√			15'	
	NEAR GRD RG							√√√		30'	4 3/4" D.L. (86%). RISER ENTERS
GROUND RING											BOTTOM. PART OF STEEL CLUMP
GROUND LEG NO. A	UPPER END										VISIBLE ABOUT 4' AWAY.
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

TWO LEGS ↓

DATE: 3 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: _____



D - 5 - S

LOCATION: E 131° 31' 10" S
N 35° 17' 15.2"

ELEV FIRM BOTTOM 26'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	4 MT			1
RISER CHAIN	R		2 3/4"	38'	1
			2 1/2"	7' 45'	
LEG CHAIN	L1		2 1/4"	120'	1
	L2		2 1/4"	120'	1
ANCHOR	A 1	8 T			1
	A 2	6 T			1
SINKER (CLUMP)	C	8 T			1
BUOY SHACKLE	BS		3 1/4"		1
MOORING SHACKLE	MS 1		3 1/2"		1
	MS 2		3"		3
	MS 3		2 1/2"		1
JOINING SHACKLE	JS 1		3 1/4"		1
	JS 2		3"		3

FIGURE A-10. MOORING D5S SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-1

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and its bottom is covered with 2 to 3 inches of marine growth.

Riser

Although the upper section is in good condition, measurements taken of the lower section were all between 80 and 90 percent of its original wire diameter (2 1/2 inches). The lower end of the riser is connected to a sinker at a water depth of 25 feet.

Ground Legs

About 30 feet of the two parallel ground legs were visible before the ground leg chain entered the bottom. Each of the two ground legs was connected to the hairpin of the sinker with a shackle. Both of the legs enter the bottom to the east of the sinker. Both legs measured to be between 80 and 90 percent.

Sinker

The mooring's 8 ton sinker was located at the base of the riser. Although partially submerged in the bottom the sinker appears to be in good condition.

Anchors

Not visible for inspection.

Recommendation

This mooring is in fair condition.

Although the schematic drawing of this mooring (Figure A-11) indicates the two ground legs should be 80 degrees apart, they do, in fact, run side-by-side until entering the

bottom about 30 feet from the sinker. Recommend that these legs be relayed along their proper orientation during the next scheduled overhaul. In the interim, this mooring should be in satisfactory condition for utilization as a class D mooring.

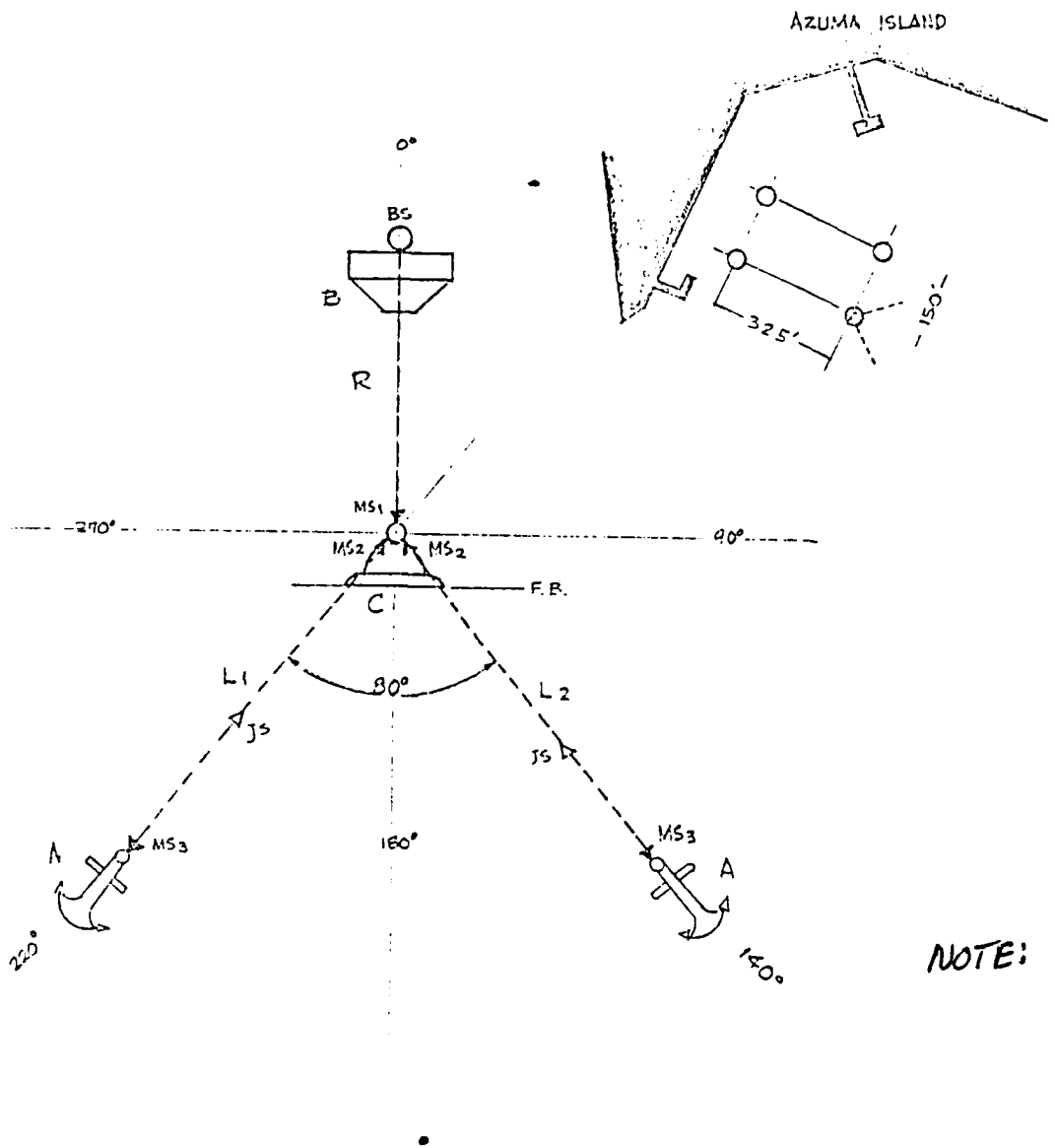
MOORING NO.: X-1 CLASS: D LOCATION: YOKOSUKA LAT: 139°-34'-21.5"N LONG: 35°-17'-44.5"E

WATER DEPTH: 25' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility ~4' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION NEW	SINGLE LINK % 90+	SINGLE LINK % 80+	SINGLE LINK % 80-	DOUBLE LINK % 90+	DOUBLE LINK % 80+	DOUBLE LINK % 80-	D	COMMENT
BUOY HARDWARE											FIBERGLASS COATED. MARINE
1 1/2" SHACKLE											GROWTH 2-3 INCHES.
1 1/2" SHACKLE											
3 3/4" SHACKLE											
RISER CHAIN											
RISER	NEAR BUOY		2 1/2"				VVV			10'	RISER CONNECTED TO SINKER BY 3"
	MIDDLE		↓				VVV			15'	END LINK AND 4" SHACKLE. HAIR PIN
	NEAR GRD RG		↓					VVV		25'	MEASURED 4 7/8". (2 1/4" GAUGE USED)
GROUND RING											
GROUND LEG NO. A	UPPER END		2 1/8"		VVV						CONNECTED TO HAIR PIN WITH
	MIDDLE	TWO LEGS	↓								3" SHACKLE
	ENTERS BOTTOM		↓								
GROUND LEG NO. B	UPPER END		2 1/8"		VVV						CONNECTED TO HAIR PIN WITH 3 1/2"
	MIDDLE		↓								SHACKLE.
	ENTERS BOTTOM		↓								BOTH LEGS ENTER THE BOTTOM
GROUND LEG NO. C	UPPER END										ABOUT 30 FEET EAST OF THE
	MIDDLE										SINKER.
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 3 MAY 1983 ENGINEER IN CHARGE: T. JONES DIVERS: MILLER / PATIERNE



X - 1

LOCATION: E 134° 34' 21½"
N 35° 17' 44½"

ELEV FIRM BOTTOM 32'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	QTY
BUOY	B	6 MDT			1
RISER CHAIN	R		2½"	45'	1
LEG CHAIN	L1		2⅛"	110'	1
	L2		2⅛"	150'	1
CLUMP (SINKER)	C	8 T			1
ANCHOR	A	6 T			2
BUOY SHACKLE	BS		4"		1
MOORING SHACKLE	MS1		3½"		1
	MS2		3¼"		2
	MS3		3"		2
JOINING SHACKLE	JS		3"		2

NOTE: ONE LEG MEASURED 2⅛" (SINGLE LINK) BY DIVERS — MAY 198?

FIGURE A-11. MOORING X-1 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-2

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and its top was recently repainted. The fenders are in good condition but the buoy has a slight list.

Riser

The riser chain was originally 2 1/2 inches of wire diameter and still measures to be greater than 90 percent of this size. The chain has no marine growth on it. Only 3 feet of riser chain lies on the bottom before it is attached to a sinker with a 3-inch end link and a 4-inch shackle.

Ground Legs

The upper ends of two ground legs were visible. These legs were both attached to the sinker hairpin with end links and shackles. About 3 feet of the northern and 50 feet of the western legs were visible before they enter the bottom.

Anchors/Sinker

The partially buried sinker appears to be in good condition but the anchors were not visible.

Recommendation

This mooring is in good condition and satisfactory for continued use as a class D mooring. Figure A-12 is a schematic drawing of the mooring.

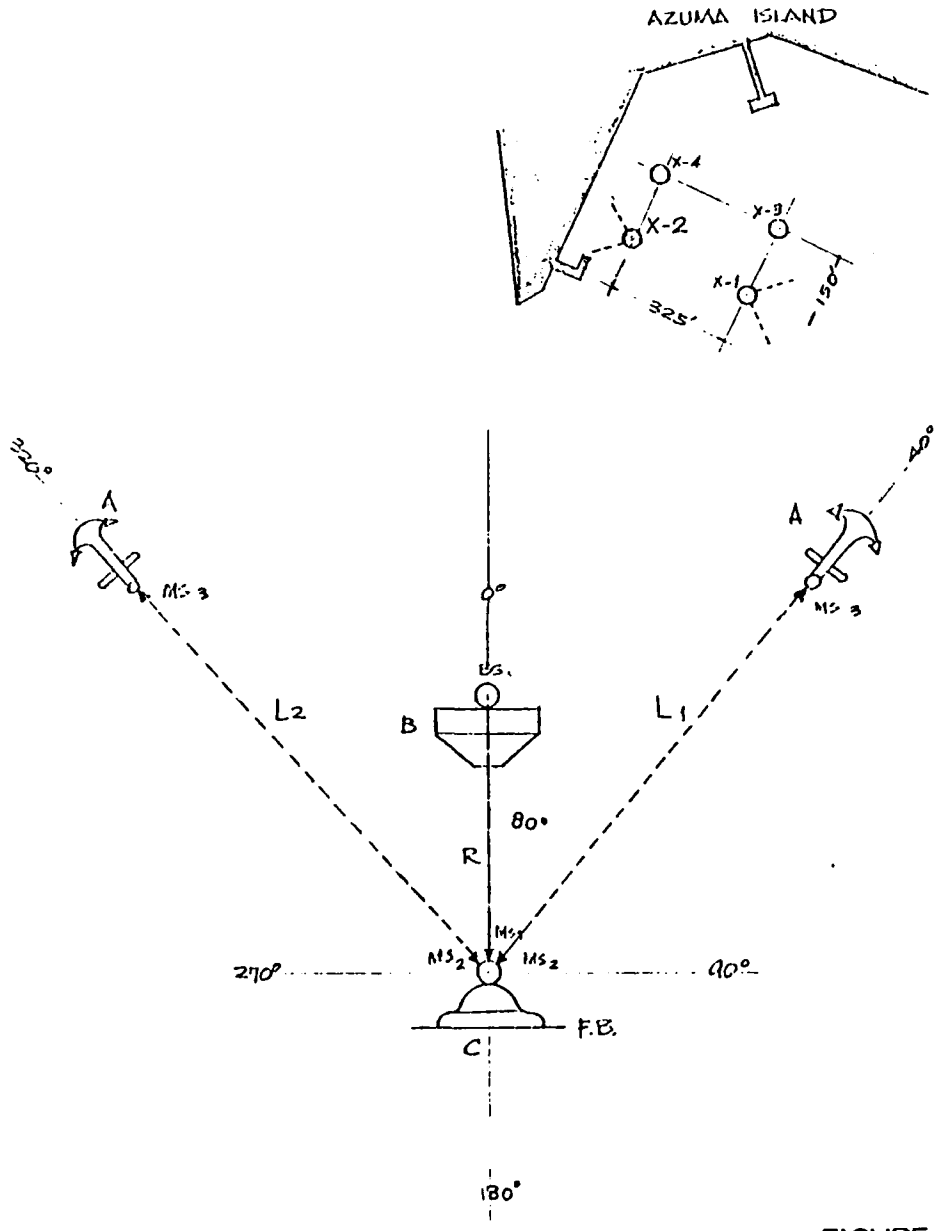
MOORING NO.: X-2 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-26.5"N LONG: 35°-17'-44"E

WATER DEPTH: 10' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility 4'-6' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION							D	COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %				
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS COATED. TOP
1½" SHACKLE											REPAINTED. FENDERS OK. BUOY
2" SHACKLE											HAS SLIGHT LIST.
3" SHACKLE											
3½" SHACKLE											
RISER	NEAR BUOY		2½"				VVV			<10'	CLEAN CHAIN. THREE FEET ON
	MIDDLE	✓	↓								BOTTOM LEADING TO SINKER WHICH
	NEAR GRD RG		↓				VVV			10'	HAS 4¼" HAIRPIN.
GROUND RING											
BRNG GROUND LEG NO. A NORTH	UPPER END	✓								10'	2½" END LINK AND 2¾" SHACKLE
	MIDDLE	TWO LEGS									CONNECT LEG TO SINKER. THREE
	ENTERS BOTTOM										FEET ON BOTTOM.
BRNG GROUND LEG NO. B WEST	UPPER END		2⅛"	VVV						10'	2½" END LINK AND 2¾" SHACKLE
	MIDDLE		↓								CONNECT LEG TO SINKER. ~50'
	ENTERS BOTTOM		↓								ON BOTTOM BEFORE ENTERING MUD.
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 3-4 MAY 1983 ENGINEER IN CHARGE: T. JONES DIVERS: _____



X - 2						
LOCATION: E 139° 31' 26½ N 35° 17' 44°				ELEV. FROM BOTTOM	20'	
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	QTY	
BUOY	B	4 WDT			1	
FIBER CHAIN	R		2½"	30'	1	
LEG CHAIN	L1		2⅛"	75'	1	
	L2		2⅛"	110'	1	
CLUMP (SINKER)	C	6 T			1	
ANCHOR	A	6 T			2	
BUOY SHACKLE	BS		3¼"		1	
MOORING SHACKLE	MS 1		3½"		1	
	MS 2		3¼"		2	
	MS 3		3"		2	

FIGURE A-12. MOORING X-2 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-3

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. There is some moderate rust on the top of the buoy and the chafing rail is broken. The buoy has two rubber fenders in good condition and has been partially repainted.

Riser

The riser originally had a 2 1/2-inch wire diameter and still measures greater than 90 percent of the initial size. The riser enters the bottom at a 25-foot water depth.

Ground Legs/Sinker/Anchors

Although the divers could feel the top of the buried sinker, the ground legs, anchors and sinker were not visible.

Recommendations

This mooring is in good condition and satisfactory for continued use as a class D mooring. Figure A-13 is a schematic drawing of the mooring.

MOORING NO.: X-3 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-22" LONG: 35°-17'-46"

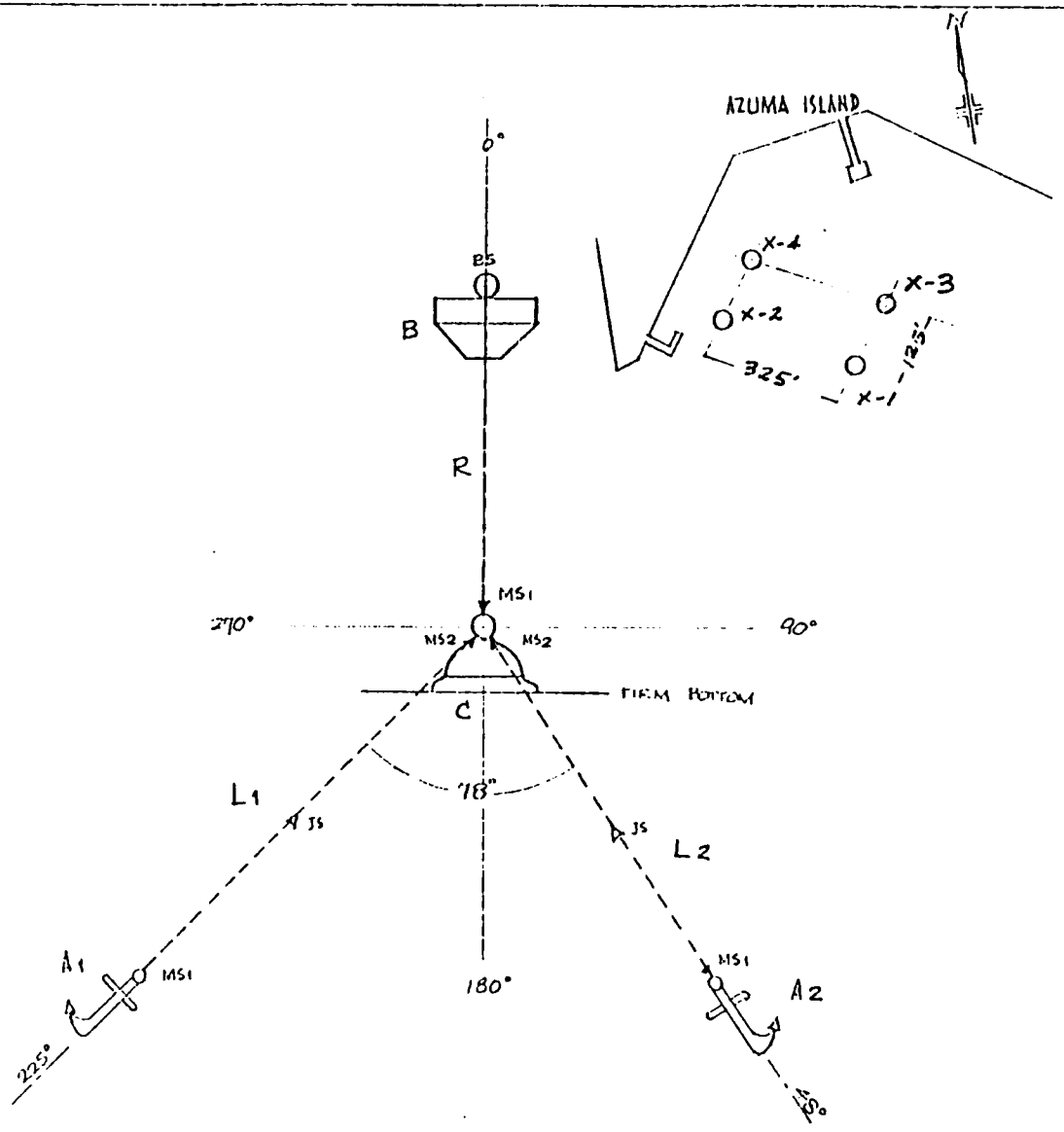
WATER DEPTH: 25' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility 4'-6' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION							D	COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %				
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											MODERATE RUST ON TOP. BROKEN
1½" SHACKLE											CHAFING RAIL. TWO RUBBER
1¾" SHACKLE											FENDERS IN GOOD CONDITION.
3¾" SHACKLE											PARTIALLY REPAINTED
RISER CHAIN											
RISER	NEAR BUOY		2½"				√√√			10'	2¾" GAUGE USED
	MIDDLE		↓				√√√			17'	
	NEAR GRD RG		↓				√√√			25'	ENTERS BOTTOM VERTICALLY
GROUND RING											
GROUND LEG NO. A	UPPER END	TWO LEGS									DIVERS COULD FEEL TOP OF
	MIDDLE	↓									BURIED SINKER. GROUND LEGS/
	ENTERS BOTTOM	↓									ANCHORS / SINKER NOT VISIBLE.
GROUND LEG NO. B	UPPER END	↓									
	MIDDLE	↓									
	ENTERS BOTTOM	↓									
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

A-42

DATE: 3 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: _____



X - 3

LOCATION : E 139° 39' 22"
N 35° 17' 46"

ELEV FIRM BOTTOM 34'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	QTY
BUOY	B	4 WDT			1
RISER CHAIN	R		2½"	54'	1
LEG CHAIN	L1		2"	150'	1
	L2		2"	150'	1
CLUMP (SINKER)	C	6T			1
ANCHOR	A1	4T			1
	A2	6T			1
BUOY SHACKLE	BS		3¼"		1
MOORING SHACKLE	MS1		3¼"		3
	MS2		2½"		2
JOINING SHACKLE	JS		3⅛"		2

FIGURE A-13. MOORING X-3 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-4

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. This buoy was recently repainted and is in good condition.

Riser

The riser chain was originally 2 1/2-inch wire diameter and still measures greater than 90 percent of its initial size. About 10 feet of riser chain rests on the bottom (12 feet of water depth) before it is connected to a sinker hairpin with a 3 1/2-inch shackle.

Ground Legs

The upper portions of both ground legs were visible. About 40-45 feet of the legs were observed before they entered the bottom. Both legs were badly rusted and measured only between 80 and 90 percent of their original wire diameter (1 3/4 inches).

Sinker/Anchors

Not visible for inspection.

Recommendation

This mooring is in fair condition.

Due to the initial size (1 3/4 inches) and current condition (80-90 percent) of its ground legs, it is recommended that this mooring be downgraded from a class D to a class F mooring. Figure A-14 is a schematic drawing of this mooring.

MOORING NO.: X-4 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-26" LONG: 35°-17'-45.5"

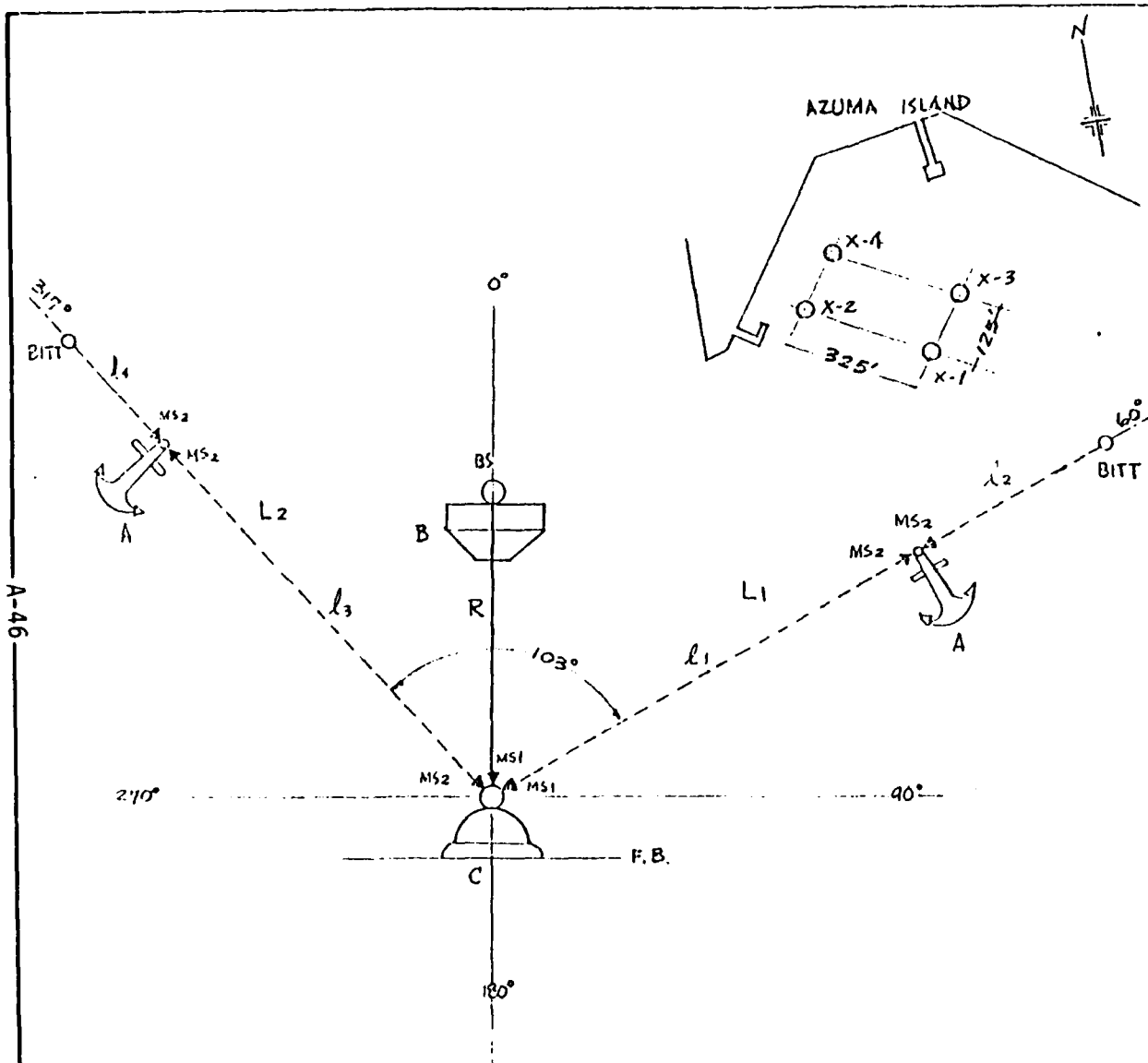
WATER DEPTH: 12' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSE PIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility _____ D = depth NI = not inspected, inaccessible.

COMPONENTS		NI	CONDITION							D	COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %				
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											BODY LOOKS GOOD. NEW PAINT JOB
1½" SHACKLE											
2" ↓											
3"											
4"											
RISER	NEAR BUOY		2½"				√√			<10'	10' RISER CHAIN ON BOTTOM. RISER
	MIDDLE		↓				√√			10'	CONNECTED TO SINKER WITH 3½"
	NEAR GRD RG		↓	√√						12'	SHACKLE.
GROUND RING											
BRG GROUND LEG NO. A 050°	UPPER END	TWO LEGS	1¾"		√√					12'	CONNECTED TO SINKER WITH 3¾"
	MIDDLE		↓							↓	SHACKLE. ABOUT 45' VISIBLE
	ENTERS BOTTOM		↓	√	√						BEFORE ENTERING BOTTOM.
BRG GROUND LEG NO. B 130°	UPPER END		1¾"		√√						
	MIDDLE		↓								CONNECTED TO SINKER WITH 3¾"
	ENTERS BOTTOM		↓		√√					↓	SHACKLE. ABOUT 42' VISIBLE
GROUND LEG NO. C	UPPER END										BEFORE ENTERING BOTTOM.
	MIDDLE										
	ENTERS BOTTOM										BOTH LEGS CLEAN BUT RUSTY.
GROUND LEG NO. D	UPPER END										
	MIDDLE										SINKER/ANCHORS BURIED
	ENTERS BOTTOM										

DATE: 4 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: _____

CHESNAVFACENGCOM REPORT FPO-1-83(25), "PWC YOKOSUKA FLEET MOORINGS INSPECTION REPORT".



X - 4							
LOCATION: E 134° 30' 26" N 35° 17' 45½"				ELEV FIRM BOTTOM 19'			
MOORING COMPONENTS							
ITEM	SYMBOL		TONNAGE	WIRE SIZE	LENGTH		Q'TY
BUOY	B		4 WDT				1
RISER CHAIN	R			2½"	31'		1
LEG CHAIN	L1	l_1		1¾"	115'	150'	1
		l_2		1¾"	115'		
	L2	l_3		1¾"	115'	150'	1
		l_4		1¾"	115'		
CLUMP (SINKER)	C		6T				1
ANCHOR	A		2T				2
BUOY SHACKLE	BS			2¾"			1
MOORING SHACKLE	MS1			3½"			3
	MS2			2½"			4

FIGURE A-14. MOORING X-4 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-5

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. This buoy is fiberglass coated and is in good condition with about 2 inches of marine growth on the bottom.

Riser

There is about 10 feet of riser chain on the bottom, the bitter end of which is connected to a sinker with a 4-inch shackle and a 3-inch end link. Double link measurements were all greater than 90 percent of the original 3-inch wire diameter. The riser is in good condition.

Ground Legs

Two ground legs were observed; both had about 75-100 feet of chain visible and both were connected to the sinker with 3-inch shackles and end links. One leg measured greater than 90 percent of the 2 3/4-inch wire diameter guage used while the other measured between 80 and 90 percent.

Sinker/Anchors

The top of the sinker was visible but both anchors were buried.

Recommendation

This mooring is in fair condition and is satisfactory for continued use as a class D mooring. If this is intended for use as a free swinging mooring, three legs are required. Figure A-15 is a schematic drawing of the mooring.

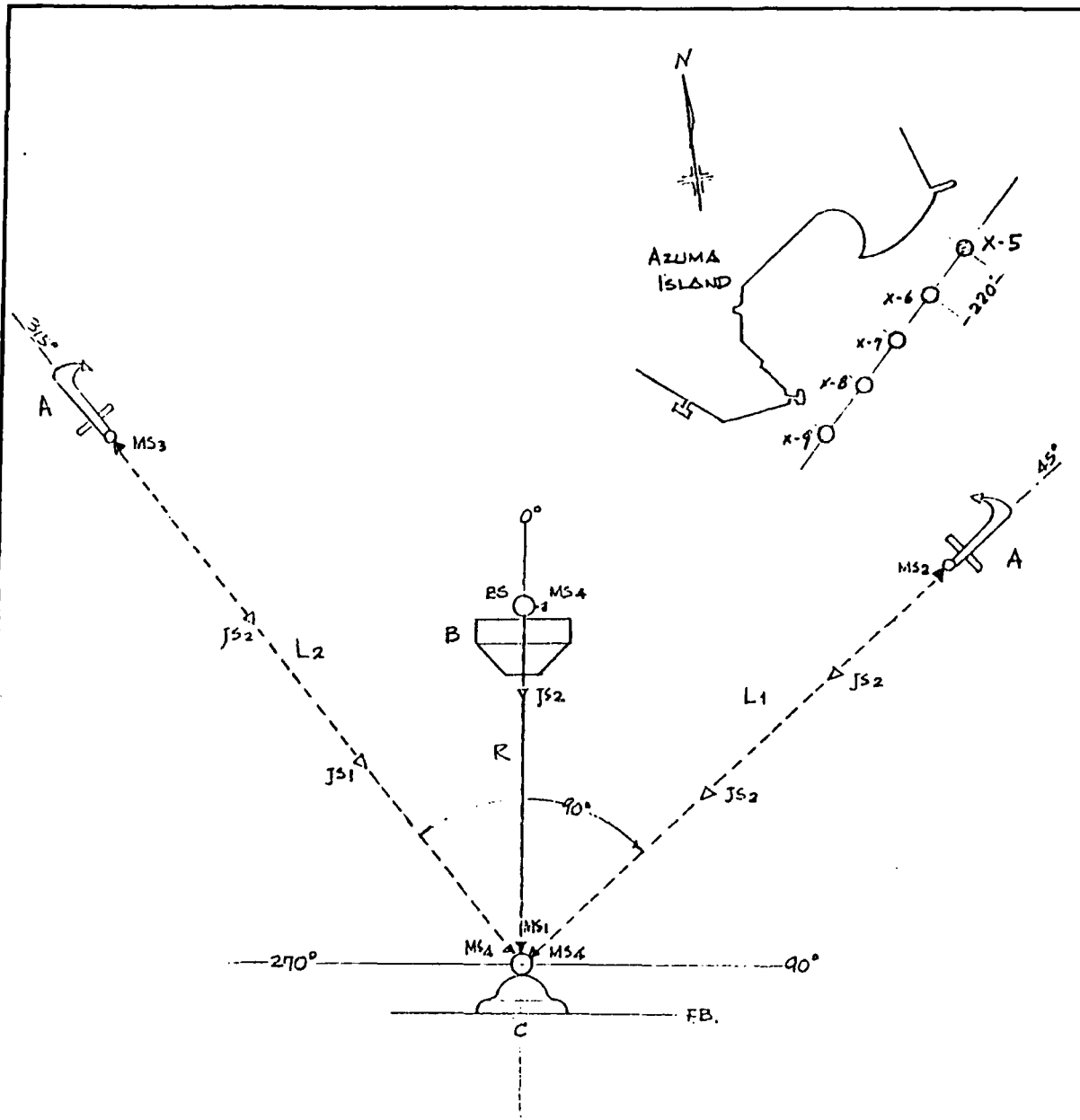
MOORING NO.: X-5 CLASS: D LOCATION: YOKOSUKA LAT: 139°-34'-24.5"N LONG: 35°-17'-55"E

WATER DEPTH: 25' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility _____ D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION							COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FRESHLY PAINTED. FIBERGLASS
1 1/2" SHACKLE											COATED
1 3/4" SHACKLE											
4" SHACKLE											
4 1/2" SHACKLE											
RISER	NEAR BUOY		3"				VVV			<10'	10' OF RISER ON BOTTOM, CONNECTED
	MIDDLE		↓				VVV			10'	TO SINKER WITH 3" END LINK AND
	NEAR GRD RG		↓				VVV			25'	4" SHACKLE.
GROUND RING											
BRNG GROUND LEG NO. A NORTH	UPPER END	TWO LEGS	2 3/4"	VVV						25'	CONNECTED TO SINKER WITH 3"
	MIDDLE		↓								SHACKLE AND END LINK. 75'-100' OF
	ENTERS BOTTOM		↓								CHAIN LEG VISIBLE.
BRNG GROUND LEG NO. B WEST	UPPER END		2 1/2"		VVV						CONNECTED TO SINKER WITH 3"
	MIDDLE		↓								SHACKLE AND END LINK. 75'-100' OF
	ENTERS BOTTOM		↓								CHAIN LEG VISIBLE.
GROUND LEG NO. C	UPPER END										
	MIDDLE										2 3/4" GAUGE USED ON LEG B
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 3/5 MAY 1983 ENGINEER IN CHARGE: T. JONES DIVERS: _____



X - 5

LOCATION: E 139° 39' 24½"
N 35° 17' 55"

ELEV FIRM BOTTOM 26'

MOORING COMPONENTS

ITEM	SYMBOL	DIMAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	8 WDT			1
RISER CHAIN	R		3"	42'	1
LEG CHAIN	L1		2½"	140'	1
	L2		2¾" / 2½"	110' 40' 150	1
CLUMP (SINKER)	C	6T			1
ANCHOR	A	6T			2
BUOY SHACKLE	BS		4"		1
MOORING SHACKLE	MS1		3 5/8"		1
	MS2		3½"		1
	MS3		3¼"		1
	MS4		3"		3
JOINING SHACKLE	JS1		3 3/8"		1
	JS2		3⅛"		4

FIGURE A-15. MOORING X-5 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-6

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated, but the glass is badly chipped. The two rubber fenders are in good condition, but the hawsepipe is badly rusted.

Riser

The original size of the riser was 2 3/4 inches, and it still measures greater than 90 percent. The upper section of the chain is covered with heavy marine growth, but the section in the wear zone is clean. About 15 feet of the riser chain rests on the bottom before it is connected to a sinker.

Ground Legs

The upper portions of three ground legs were observed. The original wire diameter of two of these legs was 2 1/8 inches and one was 2 5/8 inches. Two of the three legs were measured to be between 80 and 90 percent of their original size using a 2 1/4-inch gauge. The as-built diagram indicates that the southern leg of this mooring is also the northern leg of mooring X-7. However, this leg entered the bottom about 50 feet from the X-6 sinker and its commonality with mooring X-7 could not be verified. This leg measured much greater than 90 percent with a 2 1/4-inch gauge, therefore, it is at least 80 percent of its original 2 5/8-inch size.

Sinker/Anchors

Although the upper portion of the sinkers was visible, the anchors were not.

Recommendation

This mooring is in fair condition and satisfactory for continued use as a class D mooring. Figure A-16 is a schematic drawing of the mooring.

MOORING NO.: X-6 CLASS: D LOCATION: YOKOSUKA LAT 139°-39'-23" LONG: 35°-17'-33"

WATER DEPTH: 20' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSE PIPE

BOTTOM TYPE: ☒ SAND ☐ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility _____ D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS CHIPPED. HAWSE PIPE
1½" SHACKLE											RUSTED. FENDERS OK.
2"											
2¾"											
4½"											
RISER	NEAR BUOY		2¾"				V V V			<10'	HEAVY GROWTH
	MIDDLE						V V V			10'	
	NEAR GRD RG						V V V			20'	CLEANCHAIN. 15' OF RISER ON BOTTOM.
GROUND RING											CONNECTED TO SINKER HAIR PIN (4⅝")
BRDG GROUND LEG NO. A EAST	UPPER END		2⅛"		V V V						BY 3" SHACKLE AND A 4" END LINK
	MIDDLE										LEG A - 5' VISIBLE
	ENTERS BOTTOM										
BRDG GROUND LEG NO. B SOUTH	UPPER END		2⅝"	V V V							LEG B - 50' VISIBLE
	MIDDLE										
	ENTERS BOTTOM										
BRDG GROUND LEG NO. C WEST	UPPER END		2⅛"		V V V						LEG C - 5' VISIBLE
	MIDDLE										
	ENTERS BOTTOM										ALL THREE LEGS ARE CONNECTED
GROUND LEG NO. D	UPPER END										TO THE SINKER.
	MIDDLE										
	ENTERS BOTTOM										2¼" GAUGE USED ON LEGS

DATE: 3/5 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: _____

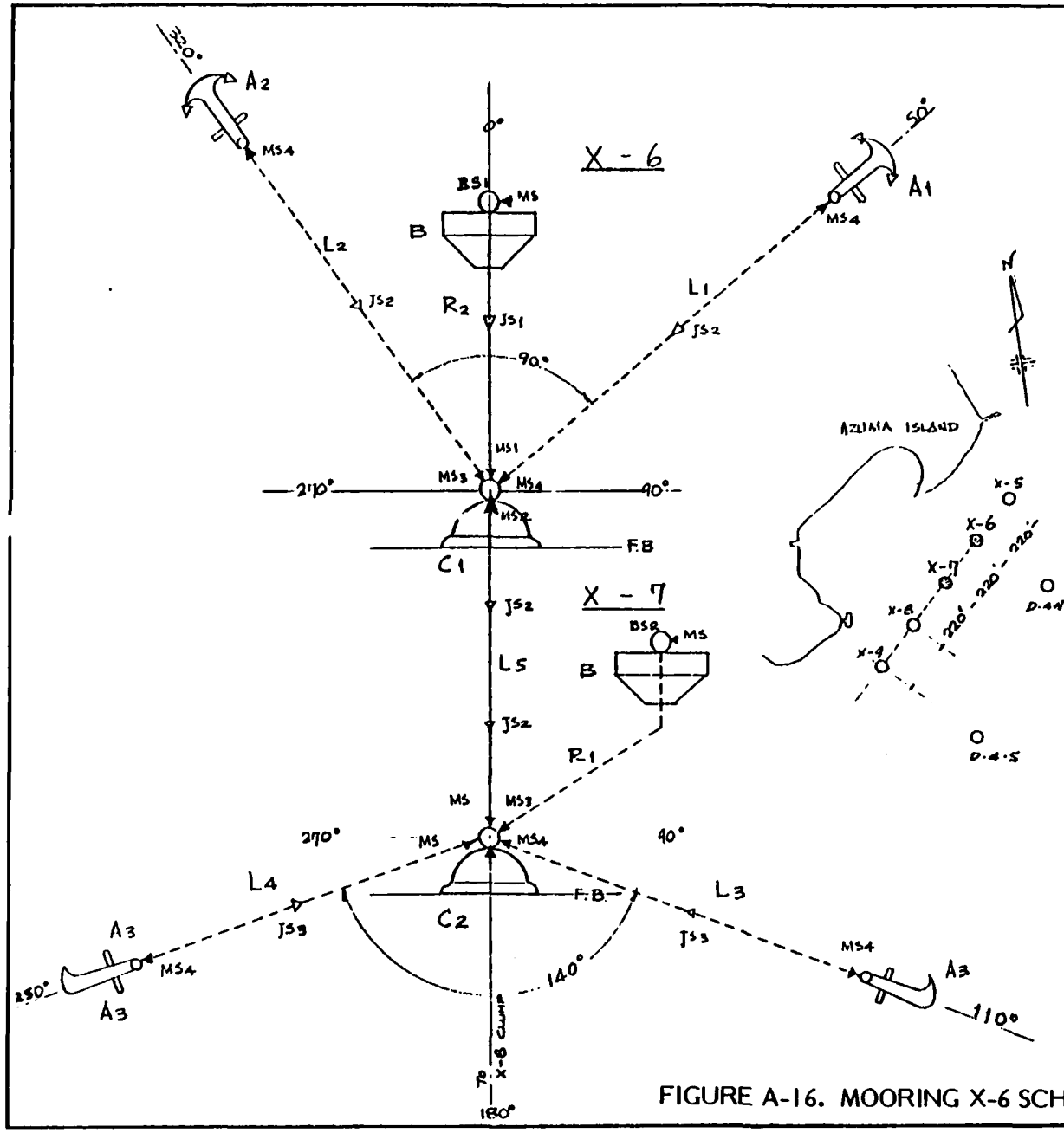


FIGURE A-16. MOORING X-6 SCHEMATIC DRAWING

X - 6 & X - 7

LOCATION: X-6 E 139° 29' 23"
N 35° 17' 03"
X-7 E 139° 29' 21"
N 35° 17' 31½"

ELEV FIRM BOTTOM X-6 26'
X-7 30'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	WEIGHT	Q'TY
BUOY	B	6 MDT			2
RISER CHAIN	R 1		2¾"	45'	1
	R 2		2¾"	41'	1
LEG CHAIN	L 1		2⅛"	150'	1
	L 2		2⅛"	150'	1
	L 3		2⅛"	114'	1
	L 4		2⅛"	114'	1
	L 5		2⅝"	220'	1
CLUMP (SINKER)	C 1	8 T			1
	C 2	6 T			1
ANCHOR	A 1	8 T			1
	A 2	6 T			1
	A 3	6 T			2
BUOY SHACKLE	BS 1		4¾"		1
	BS 2		4⅛"		1
MOORING SHACKLE	MS 1		4¼"		
	MS 2		3¾"		
	MS 3		3⅜"		
	MS 4		3½"		
	MS 5		3"		
JOINING SHACKLE	JS 1		3½"		1
	JS 2		3"		4
	JS 3		2¾"		2

INSPECTION RESULTS
MOORING X-7

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The top plate is covered with moderate rust and the buoy is in need of painting. Its two fenders are in good condition. The bottom is covered with 2 inches of marine growth.

Riser

The wire diameter of the riser chain was originally 2 3/4 inches and measurements show that the chain is still greater than 90 percent of this size. There is about 10 feet of riser chain on the bottom before the bitter end is attached to a sinker.

Ground Legs

Three legs were observed to be connected to the sinker. Two legs originally were 2 1/8 inches and a third was 2 5/8 inches. A 2 1/2-inch gauge was used to measure all three legs. Leg A measured less than 80 percent. Therefore, it is less than 94 percent of its original 2 1/8-inch size. The data is inconclusive. Leg B measures greater than 80 percent. It, therefore, is greater than 94 percent of its original size. Leg C ("L5" in fig. A-17) measures greater than 90 percent. It is, therefore, greater than 86 percent of its original 2 5/8-inch size.

Sinker/Anchors

The sinker was visible and appeared to be in good condition, but the anchors were buried.

Recommendation

This mooring is in fair condition.

Although one leg measures between 80 and 90 percent of its original size (2 5/8 inches), it is still larger than the 2-inch size required. Therefore this mooring is satisfactory for continued use as a class D mooring. Figure A-17 is a schematic drawing of the mooring.

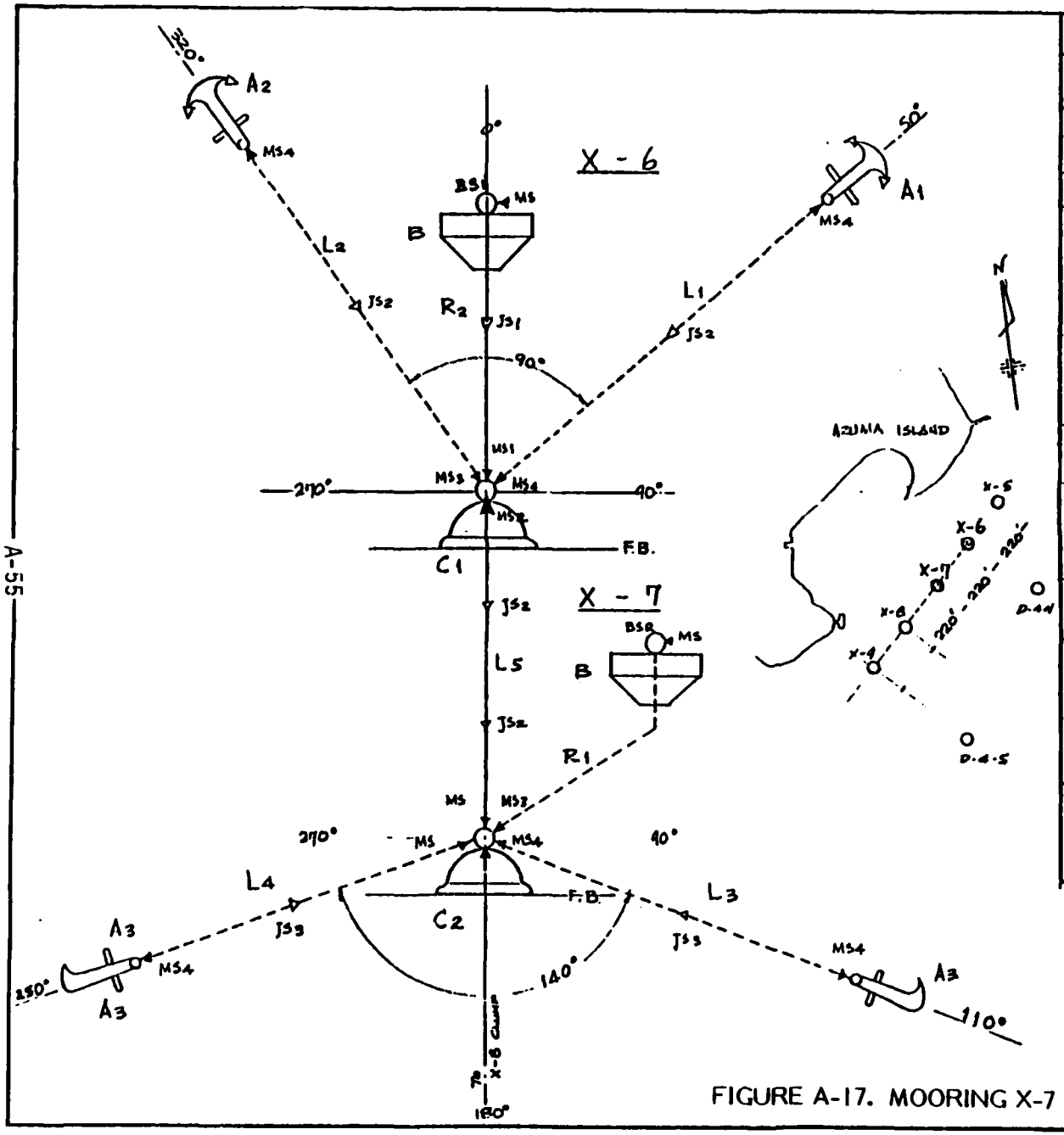
MOORING NO.: X-7 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-21" LONG: 35°-17'-35"

WATER DEPTH: 30' ANCHOR SIZE/TYPE: NF BUOY TYPE: DRUM W/ HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility _____ D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION							COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											MODERATE RUSTING TOP PLATE.
4" SHACKLE											NEEDS PAINTING. FENDERS
4½" SHACKLE											OK. TWO INCHES MARINE GROWTH
RISER CHAIN											ON BOTTOM.
RISER	NEAR BUOY		2¾"				√√√			<10'	~10' RISER ON BOTTOM PRIOR TO CONNECTION
	MIDDLE		↓				√√√			15'	TO SINKER WITH 3½" SHACKLE.
	NEAR GRD RG		↓				√√√			30'	
GROUND RING											
BRNG GROUND LEG NO. A NORTH	UPPER END		2⅛"			√√√				30'	CONNECTED TO SINKER WITH 3½"
	MIDDLE										SHACKLE AND 2¾" END LINK. SIX
	ENTERS BOTTOM										FEET OF CHAIN VISIBLE.
BRNG GROUND LEG NO. B N.E.	UPPER END	THREE LEGS	2⅛"	√√√						30'	CONNECTED TO SINKER WITH 4"
	MIDDLE										SHACKLE AND A 3½" END LINK, ABOUT
	ENTERS BOTTOM										SIX FEET OF CHAIN IS VISIBLE.
BRNG GROUND LEG NO. C S.E.	UPPER END		2⅝"		√					30'	CONNECTED TO SINKER WITH 3¾"
	MIDDLE										SHACKLE AND 3¼" AJL. LEG ENTERS
	ENTERS BOTTOM										THE BOTTOM AT THE SINKER.
GROUND LEG NO. D	UPPER END										ONLY ONE LINK VISIBLE.
	MIDDLE										
	ENTERS BOTTOM										2¼" GAUGE USED ON LEGS

DATE: 3/4 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: PATIERNE/MILLER



X - 6 & X - 7						
LOCATION: X-6 E 139° 39' 23" N 35° 17' 33" X-7 E 139° 39' 21" N 35° 17' 31½"				ELEV. FIRM BOTTOM	X-6 26' X-7 30'	
MOORING COMPONENTS						
ITEM	SYMBOL	TONNAGE	WIRE SIZE	WEIGHT	Q'TY	
BUOY	B	6 WDT			2	
RISER CHAIN	R 1		2¾"	45'	1	
	R 2		2¾"	41'	1	
LEG CHAIN	L 1		2⅛"	150'	1	
	L 2		2⅛"	150'	1	
	L 3		2⅛"	114'	1	
	L 4		2⅛"	114'	1	
	L 5		2⅝"	220'	1	
CLUMP (SINKER)	C 1	8 T			1	
	C 2	6 T			1	
ANCHOR	A 1	8 T			1	
	A 2	6 T			1	
	A 3	6 T			2	
BUOY SHACKLE	BS 1		4¾"		1	
	BS 2		4⅛"		1	
MOORING SHACKLE	MS 1		4¼"			
	MS 2		3¾"			
	MS 3		3⅞"			
	MS 4		3½"			
	MS 5		3"			
JOINING SHACKLE	JS 1		5½"		1	
	JS 2		3"		4	
	JS 3		2¾"		2	

FIGURE A-17. MOORING X-7 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-8

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and has two rubber fenders. The chain links at the top of the riser are deeply pitted. The top and side of the buoy are badly rusted beneath the fiberglass.

Riser

The original wire diameter of the riser chain was 2 3/4 inches. Double link measurements reveal that this chain is still greater than 90 percent of its initial size. About 10 feet of the riser rests on the bottom before being attached to the sinker.

Ground Legs

The top few links of each of three ground legs were visible before these legs entered the bottom. Each of the legs was measured to be greater than 90 percent of the 2 1/2-inch wire diameter gauge used. As-builts indicate two legs were 2-inch and one leg was 2 3/4-inch when new.

Sinker/Anchors

The sinker was partially buried but appeared to be in good condition. The sinker's hairpin was measured to be 4 1/2 inches. None of the anchors were visible.

Recommendation

This mooring is in good condition.

The schematic drawing of mooring X-8 (Figure A-18) shows that its two anchors are installed 180 degrees apart. Since X-8 is part of a bow/stern mooring, this angular orientation may be too large for the anchors to develop sufficient holding power when a large load is applied perpendicular to a line between the two anchors. This could result in

a large displacement of mooring X-8 when pulled toward mooring X-9. Recommend that a review of the design of mooring X-8 be conducted to determine its adequacy and possible design correction to DM-26 standards during the next scheduled overhaul.

MOORING NO.: X-8 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-19" LONG: 35°-17'-29.25"

WATER DEPTH: 28' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility < 1' D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS COATING/RUBBER FENDERS
1½" SHACKLE											OK. CHAIN LINKS AT TOP OF HAWSE
1½" SHACKLE											PIPE BADLY PITTED. RUST BLEEDING
2¼" SHACKLE											ON TOP AND SIDE OF BUOY.
3½" SHACKLE											
RISER	NEAR BUOY		2¾"				√√√			<10'	ABOUT TEN FEET ON BOTTOM PRIOR
	MIDDLE		↓				√√√			15'	TO CONNECTION VIA 3" END LINK
	NEAR GRD RG		↓				√√√			28'	AND 4" SHACKLE TO SINKER.
GROUND RING											
BRNG GROUND LEG NO. A NORTH	UPPER END		2"	√√√						28'	VISIBILITY VERY POOR
	MIDDLE		↓								
	ENTERS BOTTOM		↓								
BRNG GROUND LEG NO. B EAST	UPPER END		2"	√√√						28'	2½" GAUGE USED ON LEGS
	MIDDLE		↓								
	ENTERS BOTTOM		↓								
BRNG GROUND LEG NO. C WEST	UPPER END		2¾"	√√√						28'	
	MIDDLE		↓								
	ENTERS BOTTOM		↓								
GROUND LEG NO. D	UPPER END										ANCHORS BURIED
	MIDDLE										
	ENTERS BOTTOM										

DATE: 3/4 MAY 83 ENGINEER-IN-CHARGE: JONES DIVERS: MILLER/PATIERNE

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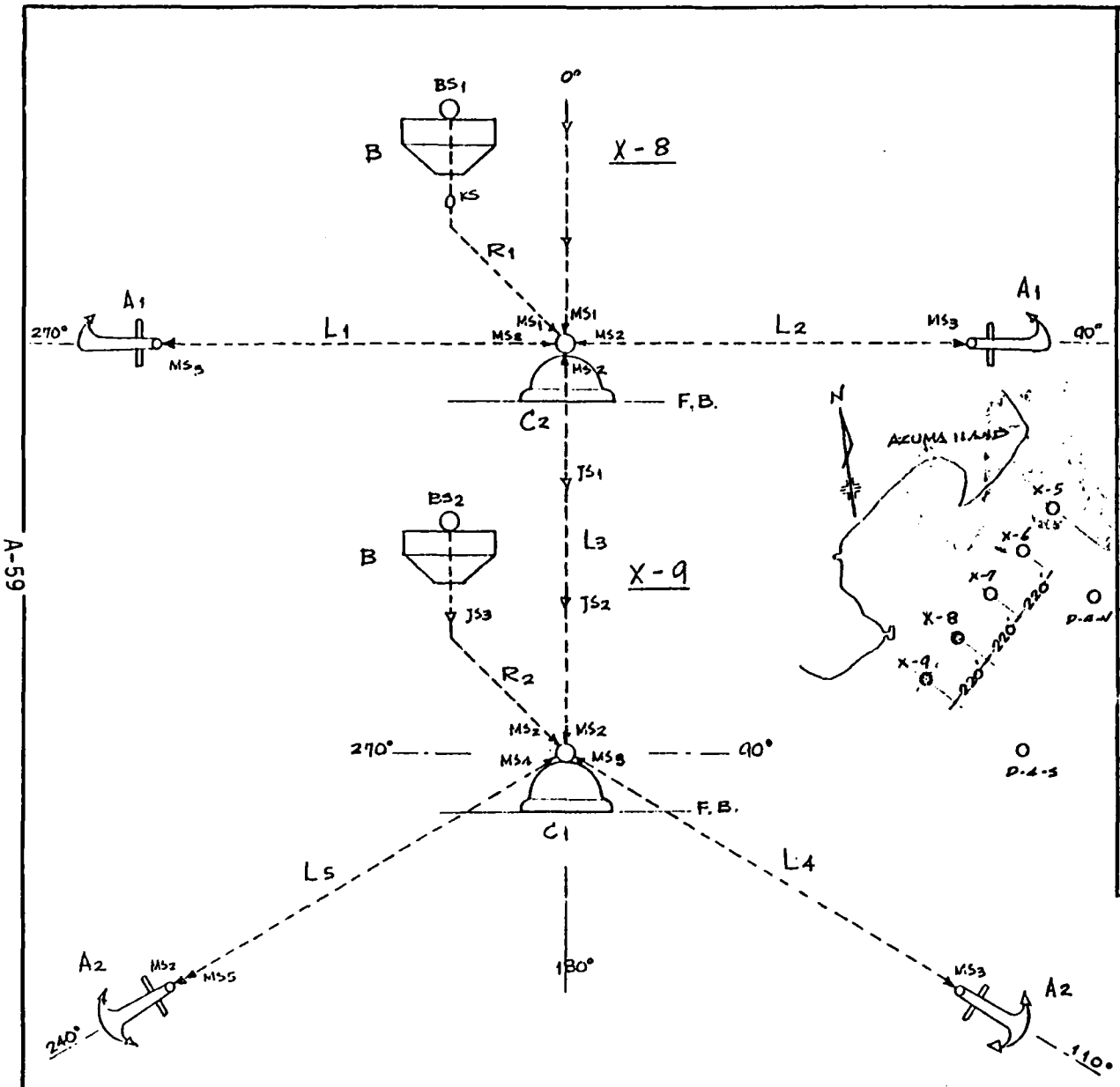

FIGURE A-18. MOORING X-8 SCHEMATIC DRAWING

X - 8 & X - 9

X-8	LOCATION	E 139° 38' 19" N 35° 17' 29¼"	ELEV FIRM BOTTOM	30'
X-9		E 139° 38' 17¼ N 35° 17' 29¼		30'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	Q'TY
BUOY	B	4 VDT			2
RISER CHAIN	R 1		2¾"	45'	1
	R 2		2¾"	42'	1
LEG CHAIN	L 1		2"	90'	1
	L 2		2"	90'	1
	L 3		2¾"	220'	1
	L 4		2"	150'	1
	L 5		2"	150'	1
CLUMP (SINKER)	C 1	8 T			1
	C 2	6 T			1
ANCHOR	A 1	6 T			2
	A 2	6 T			2
BUOY SHACKLE	BS 1		3½"		1
	BS2		3¼"		1
MOORING SHACKLE	MS1		3¾"		2
	MS2		3½"		4
	MS3		3¼"		3
	MS4		3"		1
	MS5		2¾"		1
JOINING SHACKLE	JS1		3¼"		1
	JS2		3⅜"		1
	JS3		3"		1
KENTER SHACKLE	KS		2¾"		1

INSPECTION RESULTS
MOORING X-9

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The buoy is fiberglass coated and has two rubber fenders. The top deck has a light coating of rust and the identification numbers need repainting.

Riser

Although the upper portion of the riser chain is in good condition, double link measurements near the mud line showed that this chain is between 80 and 90 percent of its original 2 3/4-inch wire diameter. About 10 feet of chain rests on the bottom prior to connection to a sinker.

Ground Legs

The upper portions of three ground legs were visible. Although the chain varied in wire size from 2 to 2 3/4 inches, single link measurements were all greater than 90 percent. About 20 feet of Leg A and 30 feet of Leg B were visible. Leg C entered the bottom immediately below its connection to the sinker.

Sinker/Anchors

The sinker has a 4 7/8-inch hairpin and is in good condition. The anchors were not visible.

Recommendation

This mooring is in fair condition.

Although certain sections of the riser chain are worn to within 80 to 90 percent of its original size, the worn chain is still larger than the 2-inch chain required for a class D mooring. This mooring, therefore, is considered to be satisfactory for continued use as a class D mooring. Figure A-19 is a schematic drawing of the mooring.

MOORING NO.: X-9 CLASS: D LOCATION: YOKOSUKA LAT 139°-39'-17.25" LONG: 35°-17'-27.5"

WATER DEPTH: 25' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

BOTTOM TYPE: ☐ SAND ☒ MUD ☒ CLAY ☐ CORAL ☒ ROCK Visibility _____ D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											SLIGHTLY RUSTED TOP DECK.
1½" SHACKLE											RUBBER FENDERS. IDENTIFICATION
1¾" SHACKLE											NUMBERS NEED REPAINTING.
3½" SHACKLE											
RISER CHAIN											
RISER	NEAR BUOY		2¾"				VVV			<10'	TEN FEET ON BOTTOM PRIOR TO
	MIDDLE		↓				VVV			15'	CONNECTION TO SINKER VIA 3¾"
	NEAR GRD RG		↓					VVV		25'	SHACKLE.
GROUND RING											
GROUND LEG NO. A	UPPER END		2"	VVV						25'	ABOUT 20' VISIBLE
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END		2¾"	VVV						25'	ABOUT 30' VISIBLE
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END		2"	VVV						25'	ENTERS BOTTOM IMMEDIATELY
	MIDDLE										BELOW CONNECTION TO SINKER
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										ALL THREE LEGS CONNECTED TO
	MIDDLE										SINKER WITH 3¾" SHACKLES.
	ENTERS BOTTOM										

DATE: 3 MAY 83 ENGINEER IN CHARGE: JONES DIVERS: _____

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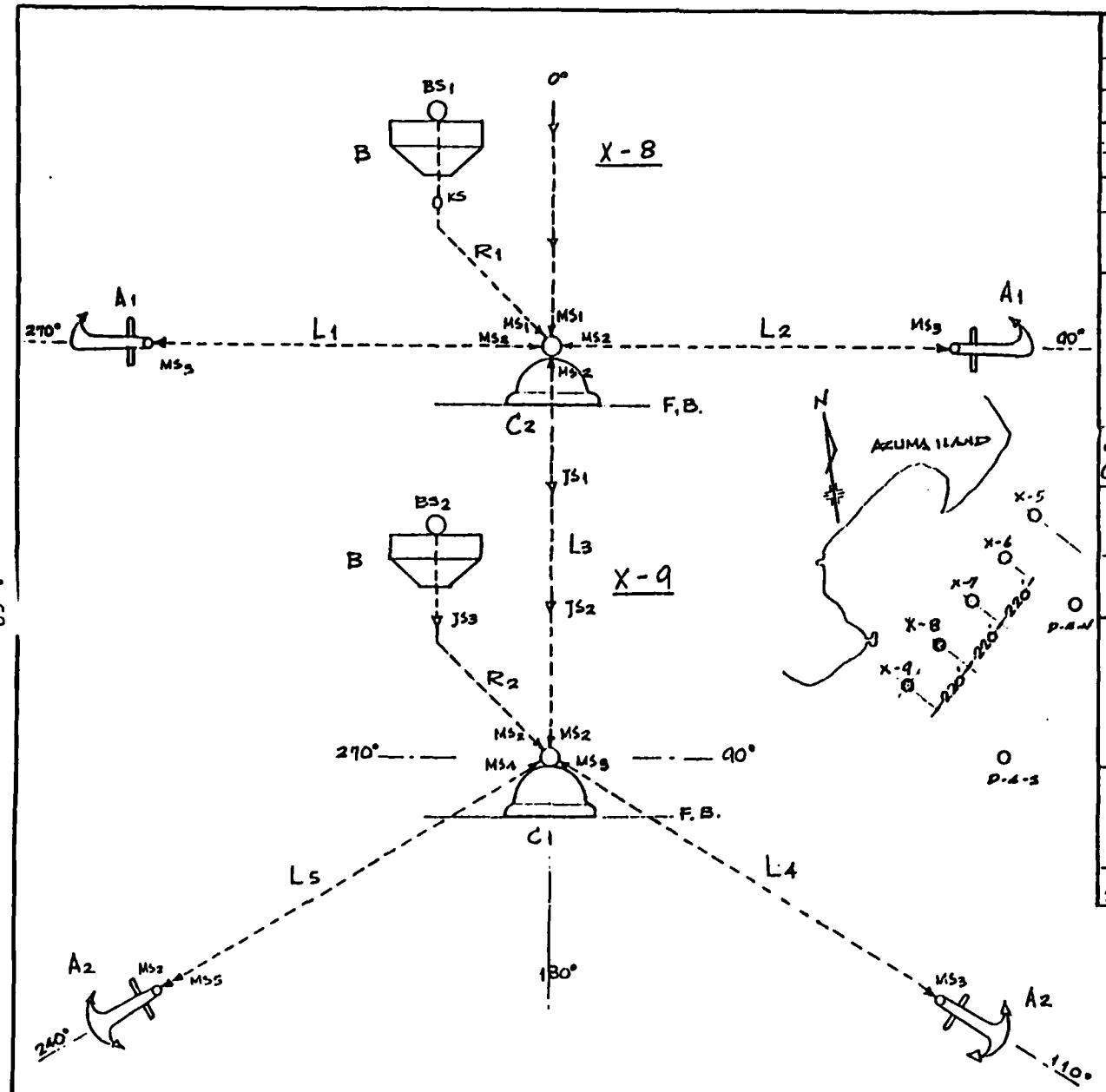


X-8 & X-9					
X-8	LOCATION	□ 139° 39' 19" N 35° 17' 29½"	ELEV FIRM BOTTOM	30'
X-9		□ 139° 39' 17¼ N 35° 17' 27¾		30'

MOORING COMPONENTS

ITEM	SYMBOL	DIAM	WIRE SIZE	LENGTH	Q'TY
BUOY	B	4 VDT			2
RISER CHAIN	R 1		2 3/4"	45'	1
	R 2		2 3/4"	42'	1
LEG CHAIN	L 1		2"	90'	1
	L 2		2"	90'	1
	L 3		2 3/4"	220'	1
	L 4		2"	150'	1
	L 5		2"	150'	1
CLUMP (SINKER)	C 1	8 T			1
	C 2	6 T			1
ANCHOR	A 1	6 T			2
	A 2	6 T			2
BUOY SHACKLE	BS 1		3½"		1
	BS2		3¼"		1
MOORING SHACKLE	MS1		3 3/4"		2
	MS2		3½"		4
	MS3		3¼"		3
	MS4		3"		1
	MS5		2 3/4"		1
JOINING SHACKLE	JS1		3¼"		1
	JS2		3⅛"		1
	JS3		3"		1
KENTER SHACKLE	KS		2 3/4"		1

FIGURE A-19. MOORING X-9 SCHEMATIC DRAWING

INSPECTION RESULTS
MOORING X-15

Buoy

This is a Japanese-built drum-type buoy with a hawsepipe. The fiberglass coating is chipped and in some areas peeling from the buoy. The hawsepipe and its enclosed riser chain are rusted, and the top deck chafing rail is damaged.

Riser

The riser originally had a 3-inch wire diameter, and double link measurements show that the size of the chain is still greater than 90 percent of this figure. The riser enters the bottom at a water depth of 40 feet.

Ground Legs/Sinker/Anchors

Not visible for inspection.

Recommendations

Although this mooring is in good condition and satisfactory for continued use as a class D mooring, the buoy should be overhauled whenever possible. If this is intended to be used as a free-swinging mooring, three legs are required. Figure A-20 is a schematic drawing of the mooring.

MOORING NO.: X-15 CLASS: D LOCATION: YOKOSUKA LAT: 139°-39'-56" LONG: 35°-17'-30"

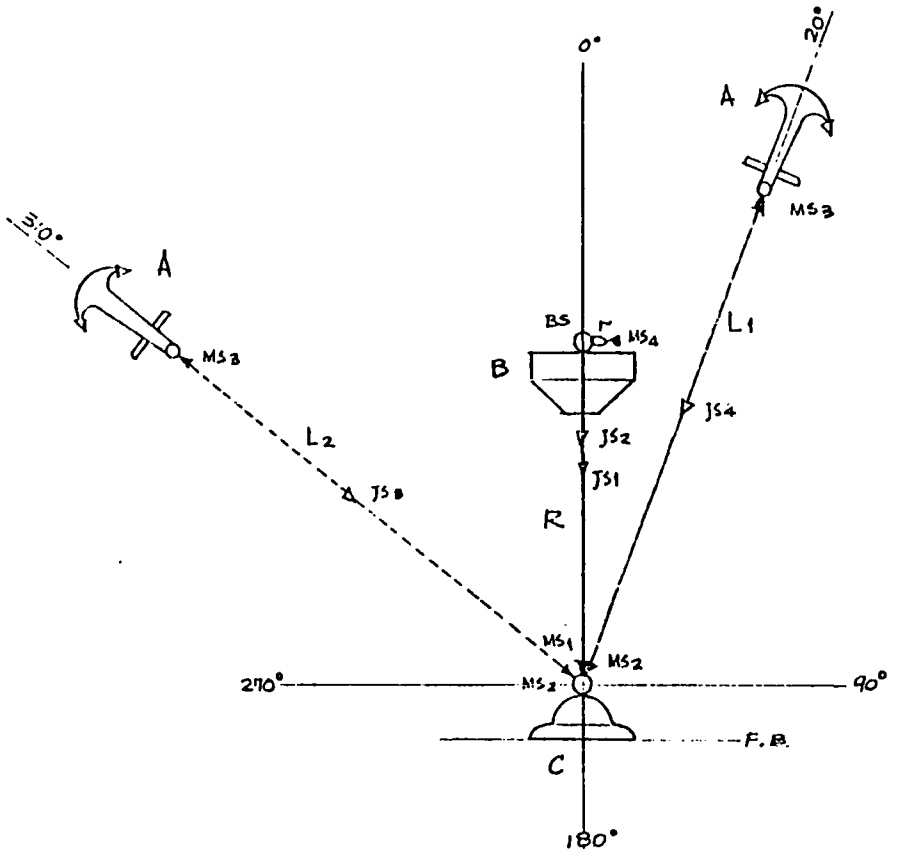
WATER DEPTH: 40' ANCHOR SIZE/TYPE: NI BUOY TYPE: DRUM W/HAWSEPIPE

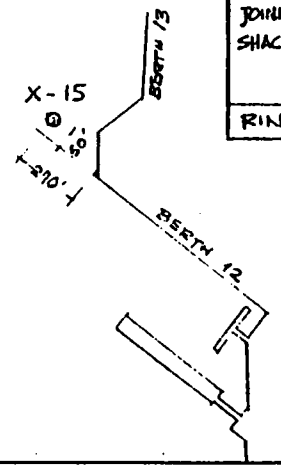
BOTTOM TYPE: ☒ SAND ☒ MUD ☐ CLAY ☐ CORAL ☐ ROCK Visibility _____ D = depth NI = not inspected, inaccessible

COMPONENTS		NI	CONDITION								COMMENT
			NEW	SINGLE LINK %			DOUBLE LINK %			D	
				90+	80+	80-	90+	80+	80-		
BUOY HARDWARE											FIBERGLASS CHIPPED/PEELING.
2" SHACKLE											CHAFING RAIL DAMAGED. RUSTY
2¼" END LINK											HAWSEPIPE. HAWSEPIPE RISER
2½" SHACKLE											CHAIN RUSTED.
4½" SHACKLE											
RISER	NEAR BUOY		3"				√√√			<10'	HEAVY MARINE GROWTH. ENTERS BOTTOM
	MIDDLE						√√√			20'	
	NEAR GRD RG						√√√			40'	
GROUND RING											
GROUND LEG NO. A	UPPER END	TWO LEGS									GROUND LEGS/SINKER/ANCHORS BURIED
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. B	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. C	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										
GROUND LEG NO. D	UPPER END										
	MIDDLE										
	ENTERS BOTTOM										

DATE: 4 MAY 1983 ENGINEER IN CHARGE: T. JONES DIVERS: MILLER/HARDING

CHESNAVFACENGCOM REPORT FPO-1-83(25), "PWC YOKOSUKA FLEET MOORINGS INSPECTION REPORT".





X - 15

LOCATION: E 139° 39' 56" N 35° 17' 30" — ELEV FIRM BOTTOM 43'

MOORING COMPONENTS

ITEM	SYMBOL	TONNAGE	WIRE SIZE	LENGTH	QTY
BUOY	B	8 WDT			1
RISER CHAIN	R		3"	55'	1
LEG CHAIN	L1		2½"	150'	1
	L2		2½"	150'	1
CLUMP (SINKER)	C	8 T			1
ANCHOR	A	6 T			2
BUOY SHACKLE	BS		3 5/8"		1
MOORING SHACKLE	MS1		3¾"		1
	MS2		3½"		2
	MS3		3¼"		2
	MS4		2 7/8"		1
JOINING SHACKLE	JS1		3½"		1
	JS2		3¼"		1
	JS3		2 5/8"		1
	JS4		2½"		1
RING	R		2 7/8"		1

FIGURE A-20. MOORING X-15 SCHEMATIC DRAWING

ANNEX B

BUOY LOCATION SURVEY DATA

ANNEX B

YOKOSUKA BUOY LOCATION SURVEY DATA. The most recent available benchmark map was dated March of 1954. Unfortunately, it was not intended for surveying points on the water. One benchmark on the chart had a clear view of the moorings and was utilized. A second benchmark was created at a location where most of the moorings could be seen. At both locations, the angles to the buoys were measured from (a) an orange and white pole visible from both sites, and (b) from magnetic north.

Until these benchmarks are accurately surveyed, no accurate position data can be generated from these angles. The benchmark map does not list latitude or longitude, only elevations. The temporary benchmark should be replaced with a more permanent concrete monument.

The first benchmark is called BM-10 and the second temporary benchmark was designated T-1 for this inspection.

DESCRIPTION OF BM-10. BM-10 is BM(A-4) from the Yokosuka Naval Base Benchmark Map, March 1954. Photograph 2, in Annex C, shows the Sherman Seawall atop which rests the brass rivet of triangulation station #10. Photograph 3 shows a view looking over this marker out to the buoys. Figures B-1 and B-2, reproduced from the referenced map, show the position of Benchmark BM-10. Photograph 1 shows the location of the orange pole from BM-10 between Drydock #5 and the Sherman Seawall. Photograph 4 is looking north-northeast from BM-10 over Pontoon #5.

DESCRIPTION OF T-1. T-1 is north of the opening of drydock No. 6. Figure B-3, reproduced from the benchmark map, shows the general location of Benchmark T-1 while Figure B-4 provides close-up details. Photographs 5, 6, and 7 are views of T-1 from the north, east, and south. Photograph 8 is a close up view of bench mark T-1.

BUOY ANGLES. Tables 1 and 2 contain the buoy angles measured from each of these two benchmarks.

NOTE: All photographs referenced above are contained in Annex C.

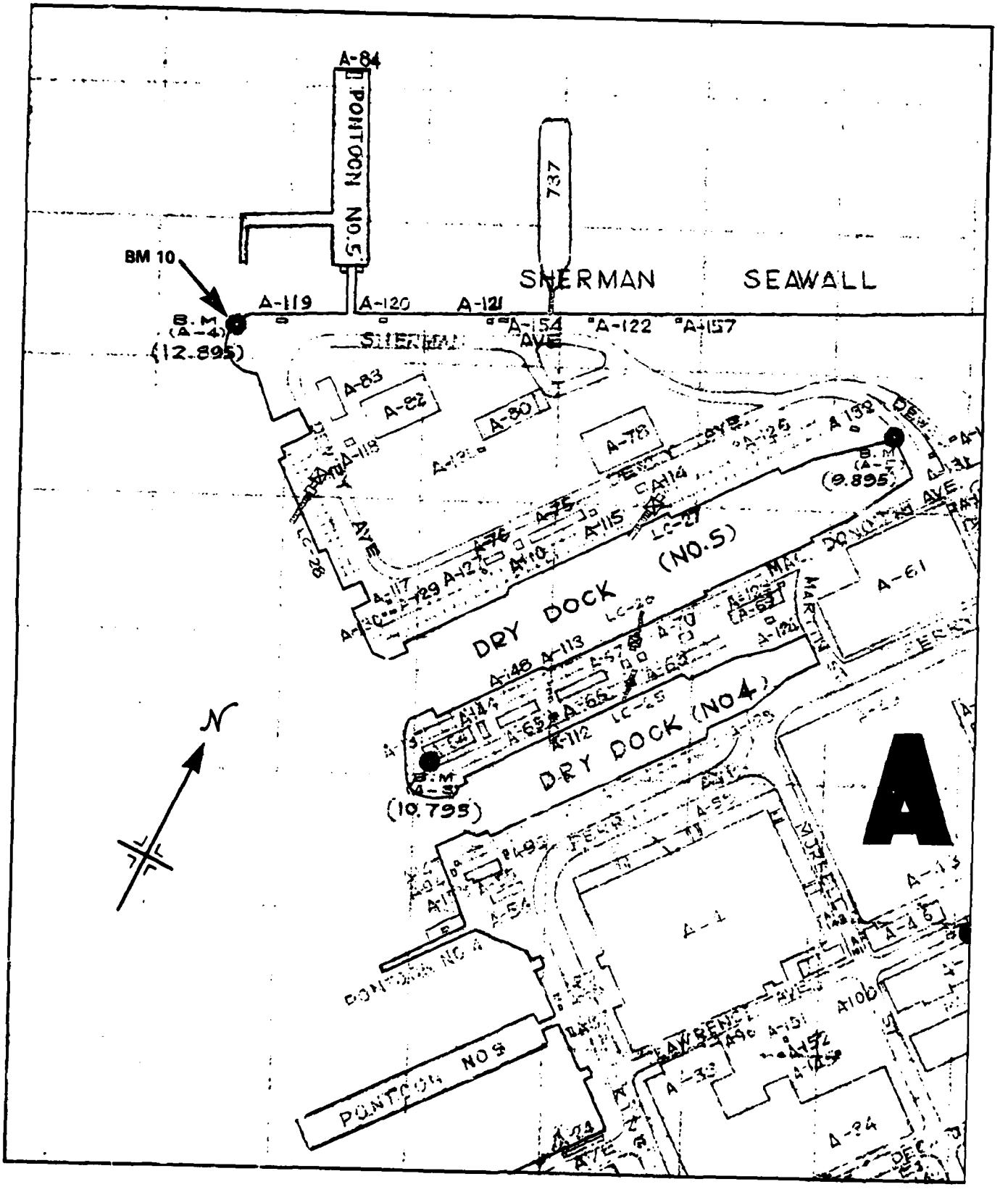


FIGURE B-1. GEOGRAPHIC LOCATION OF BENCHMARK BM-10

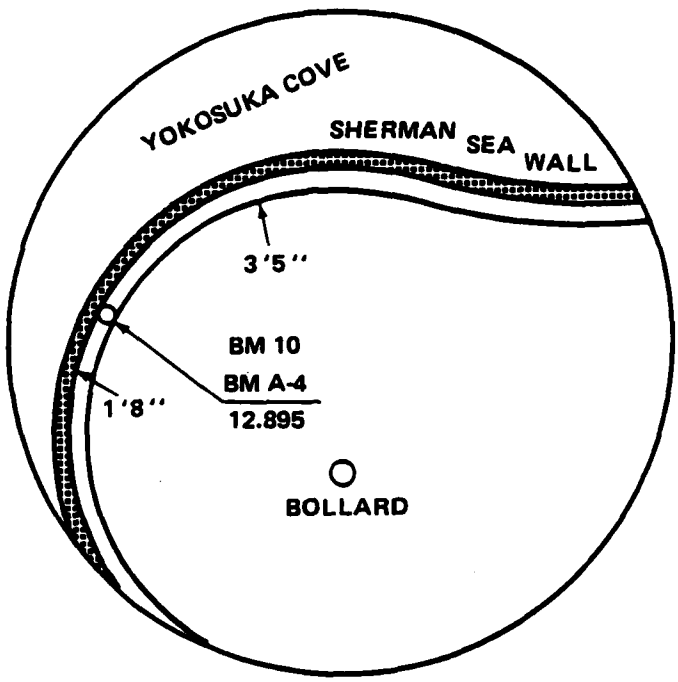


FIGURE B-2. BLOWUP OF THE SITE OF BENCHMARK B-10.

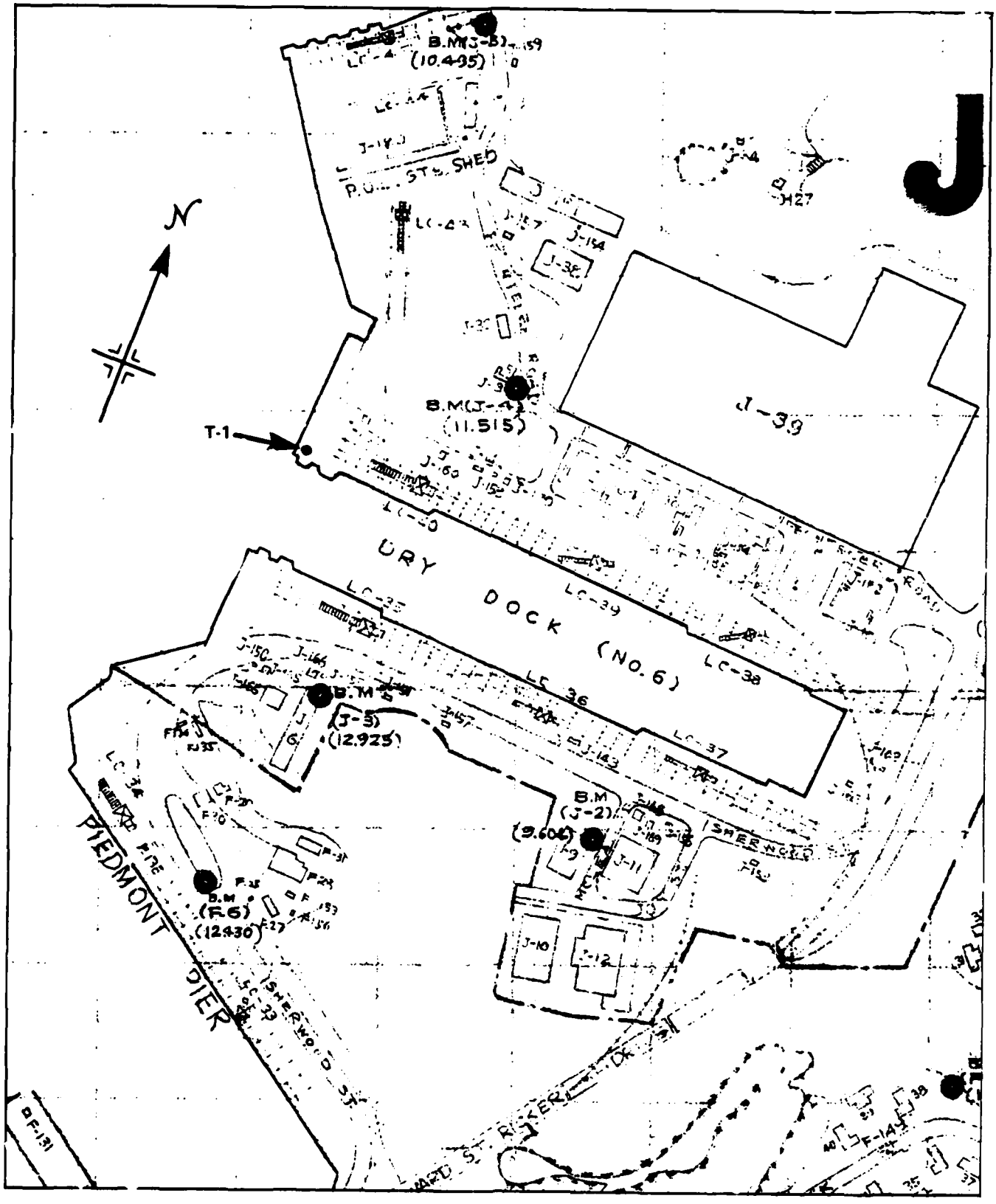
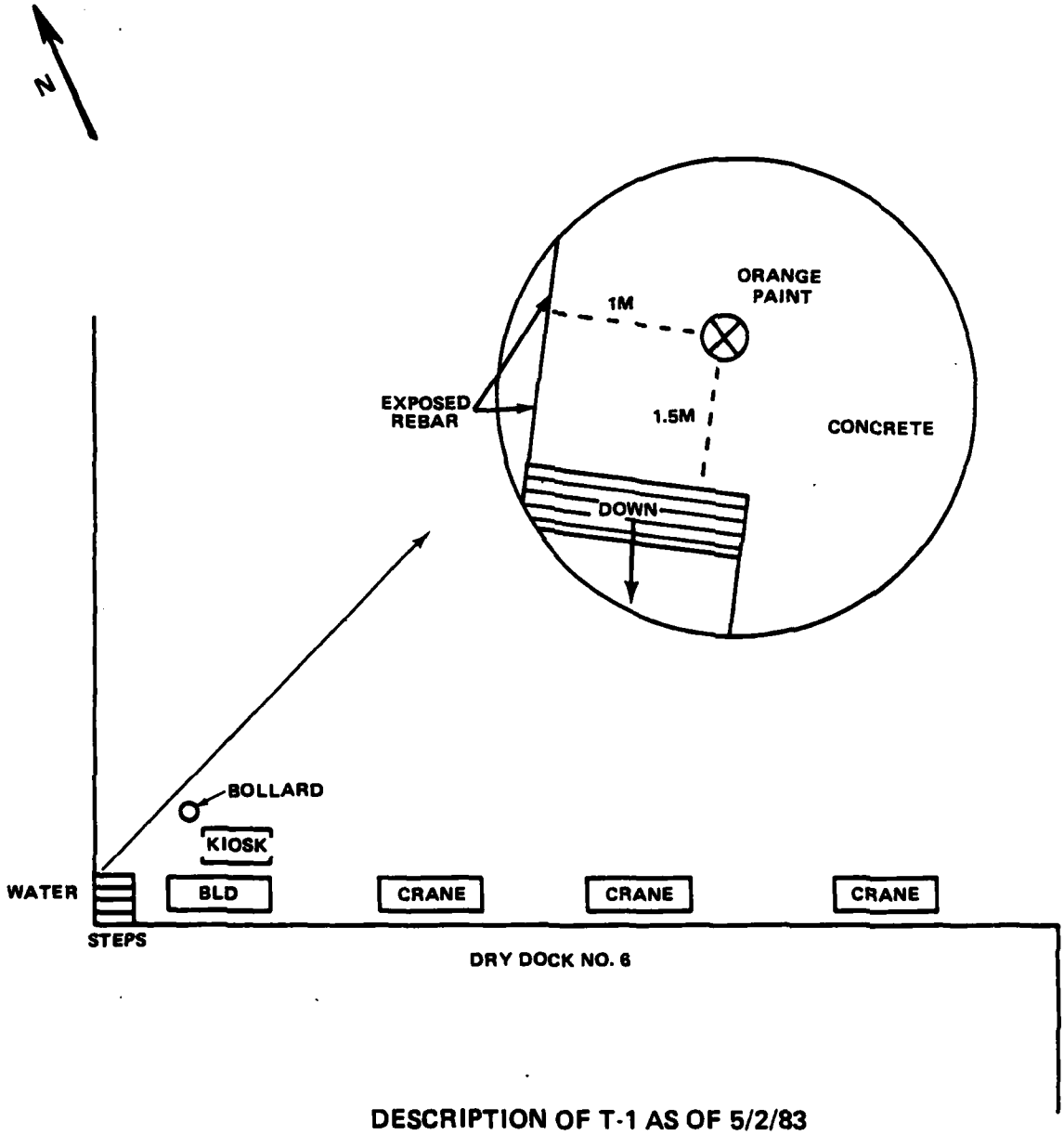


FIGURE B-3. GEOGRAPHIC LOCATION OF BENCHMARK T-1



DESCRIPTION OF T-1 AS OF 5/2/83

FIGURE B-4. BLOWUP OF LOCATION OF BENCHMARK T-1

TABLE B-1. BUOY ANGLES FROM BM-10

BUOY NUMBER	COUNTER CLOCKWISE ANGLE FROM ORANGE POLE	ANGLE FROM MAGNETIC NORTH	COMMENTS
X-15	75° 54' 00"	25° 00' 20" NE	against east shore
D-2N	95° 55' 20"	5° 13' 00" NE	
D-12N	106° 09' 00"	5° 13' 20" NW	
D-2S	107° 26' 20"	6° 30' 40" NW	
D-12S	108° 40' 00"	7° 46' 00" NW	
X-3	111° 27' 20"	10° 30' 40" NW	
X-1	113° 51' 20"	12° 57' 20" NW	
D-3N	114° 04' 20"	13° 07' 20" NW	
X-4	116° 23' 00"	15° 27' 00" NW	against sea wall
X-2	118° 22' 20"	17° 27' 20" NW	near wall, to right of buildings
D-3S	120° 55' 20"	20° 01' 00" NW	
X-5	121° 57' 20"	21° 04' 00" NW	
D-4N	123° 09' 40"	22° 15' 20" NW	
X-6	127° 20' 20"	26° 21' 20" NW	off stern of barge
X-7	133° 42' 20"	32° 46' 20" NW	standing alone
X-8	139° 47' 00"	38° 50' 20" NW	off bow of barge
X-9	144° 21' 20"	43° 27' 20" NW	
D-4S	148° 56' 00"	48° 27' 20" NW	in front of hill with bunkers
D-5N	170° 55' 20"	70° 00' 20" NW	
D-5S	173° 55' 20"	72° 55' 20" NW	rusty, no fenders

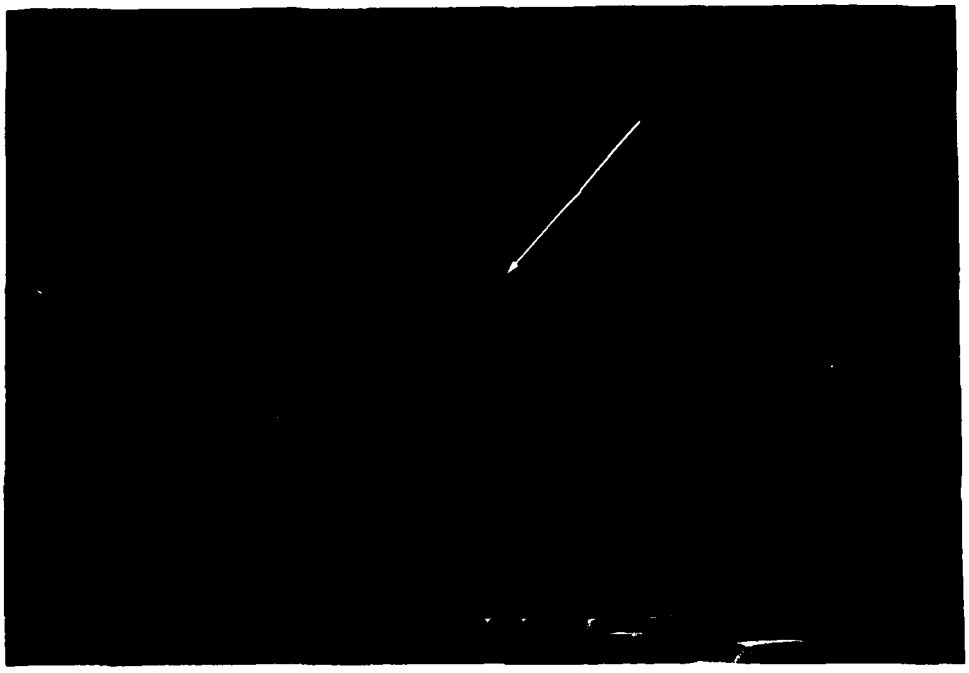
TABLE B-2. BUOY ANGLES FROM T-1

BUOY NUMBER	CLOCKWISE ANGLE FROM ORANGE POLE	ANGLE FROM MAGNETIC NORTH	COMMENTS
X-15	11° 41' 00"	139° 32' 00" SW	X-15
D-5S	28° 28' 20"	122° 42' 00" SW	Previously hidden from BM-10
D-5N	32° 06' 20"	119° 06' 20" SW	
D-4S	33° 44' 20"	117° 27' 20" SW	
X-9	41° 57' 00"	109° 17' 00" SW	stern of barge
D-4N	43° 19' 00"	107° 11' 20" SW	
X-8	43° 10' 40"	107° 22' 00" SW	bow of barge
X-7	44° 45' 00"	106° 27' 20" SW	at quaywall
D-3S	46° 26' 20"	104° 46' 20" SW	in front of sand bar
X-6	49° 02' 20"	102° 09' 20" SW	stern of large barge
X-5	51° 37' 20"	99° 35' 40" SW	bow of large barge
D-3N	54° 51' 00"	96° 21' 00" SW	in front of white bridge
D-2S	57° 05' 40"	94° 07' 00" SW	right of white bridge
D-12S	61° 45' 20"	89° 27' 40" SW	
X-2	68° 39' 00"	82° 34' 00" SW	close to quaywall with white building
X-1	68° 42' 20"	82° 28' 00" SW	in front of previous buoy
X-4	70° 12' 00"	81° 01' 20" SW	
X-3	70° 50' 20"	80° 21' 20" SW	
D-12N	71° 20' 20"	79° 42' 20" SW	against quaywall
D-2N	76° 02' 00"	75° 10' 20" SW	

ANNEX C

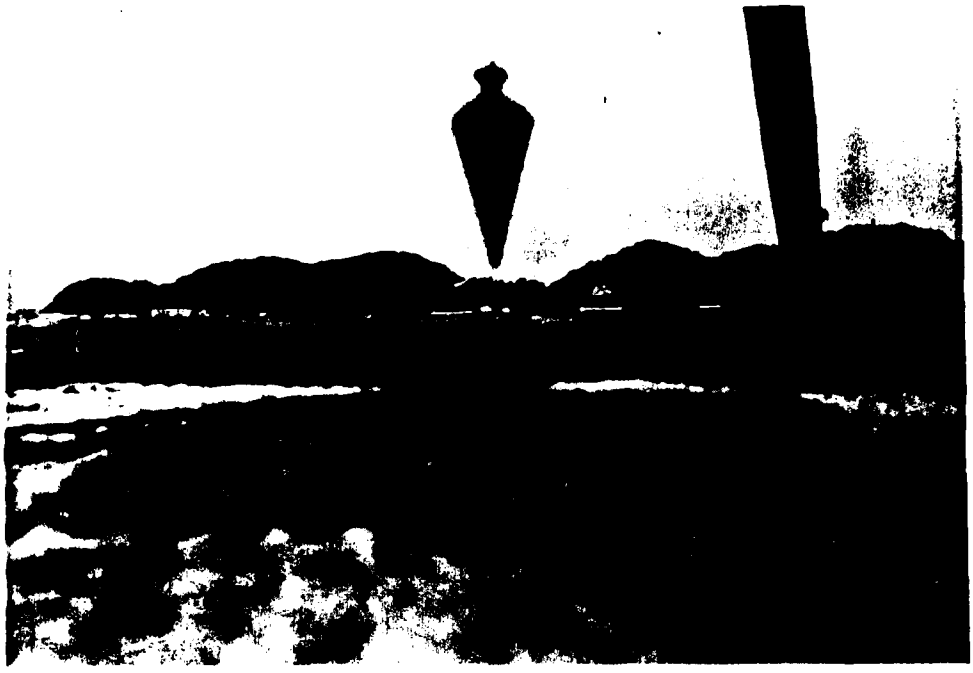
PHOTOGRAPHS

PWC YOKOSUKA SURVEY PHOTOGRAPHS



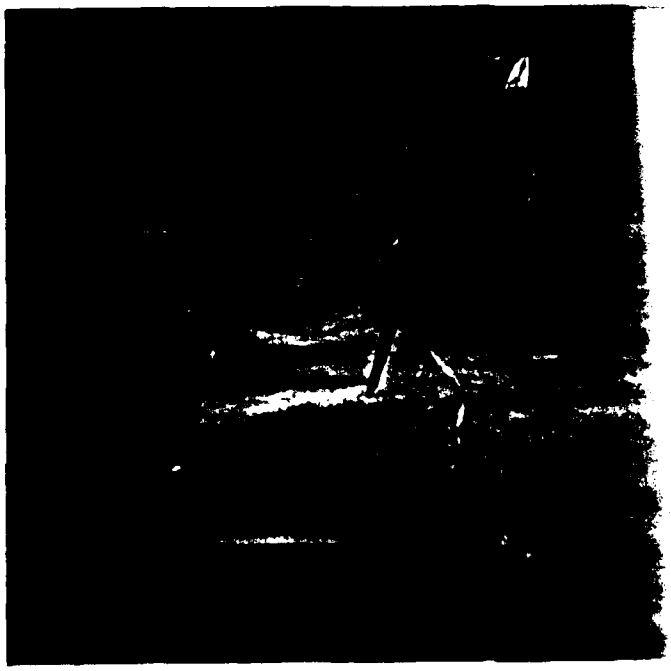
1. Orange and White Striped Reference Pole

2. Benchmark BM-10 Atop the Sherman Seawall

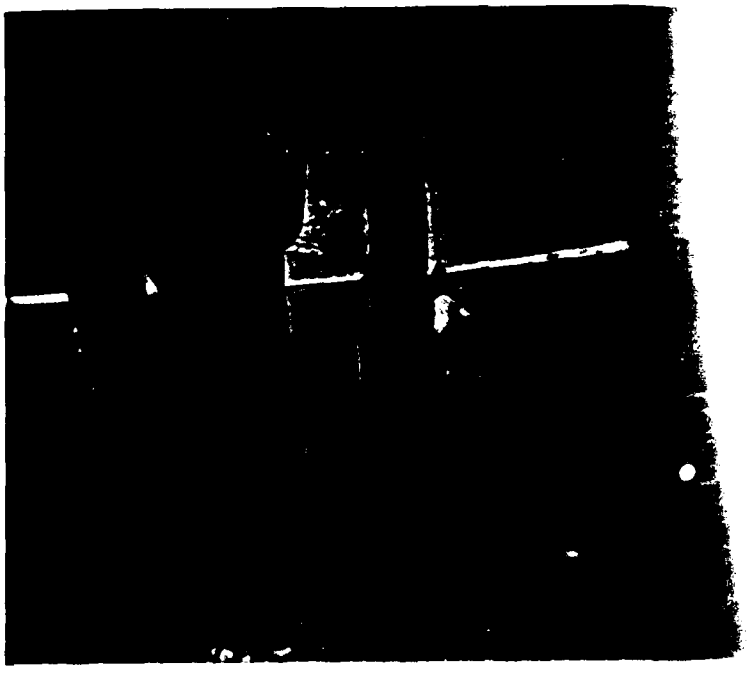


3. The Sherman Seawall and BM-10

4. Veiw to the North-Northeast of BM-10



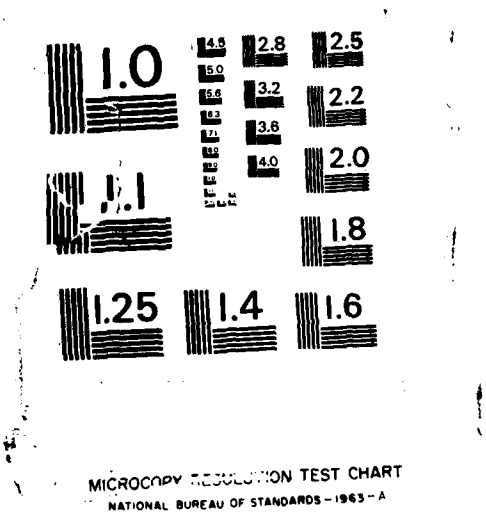
7. Veiw of Benchmark T-1 from th



8. Closeup of Benchmark T-1

AD-A167 395 PUBLIC WORKS CENTER YOKOSUKA JAPAN FLEET MOORINGS UNDERWATER INSPECTION REPORT(U) NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC CHESAPEAKE... SEP 83 2/2

UNCLASSIFIED CHES/NAVFAC-FPO-1-83 (25) F/G 13/10 NL


1.0
1.1
14.5
15.0
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16.3
17.1
18.0
2.8
3.2
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4.0
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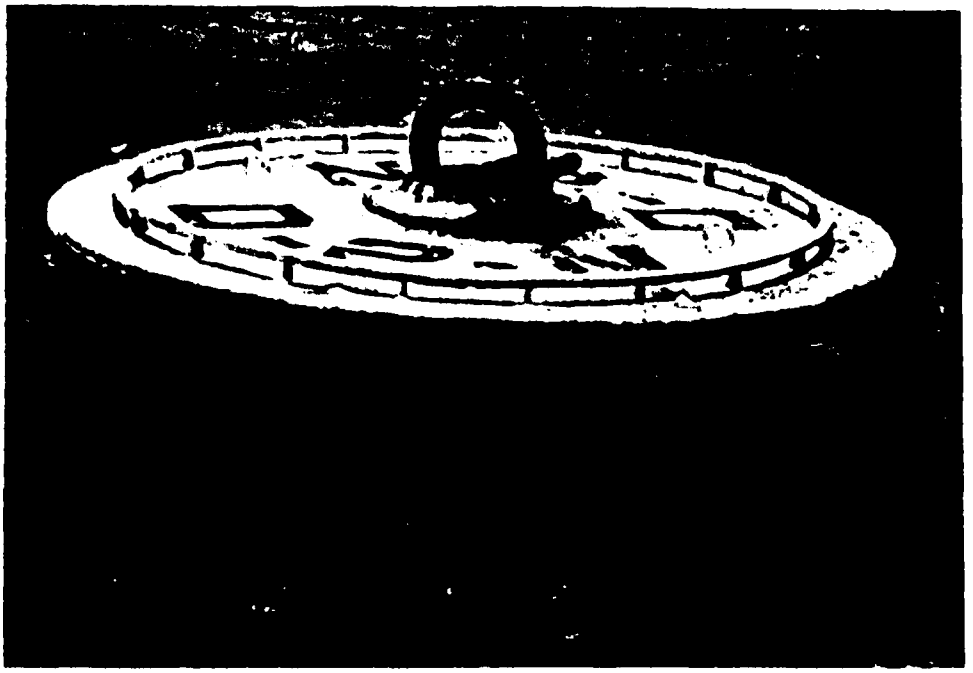
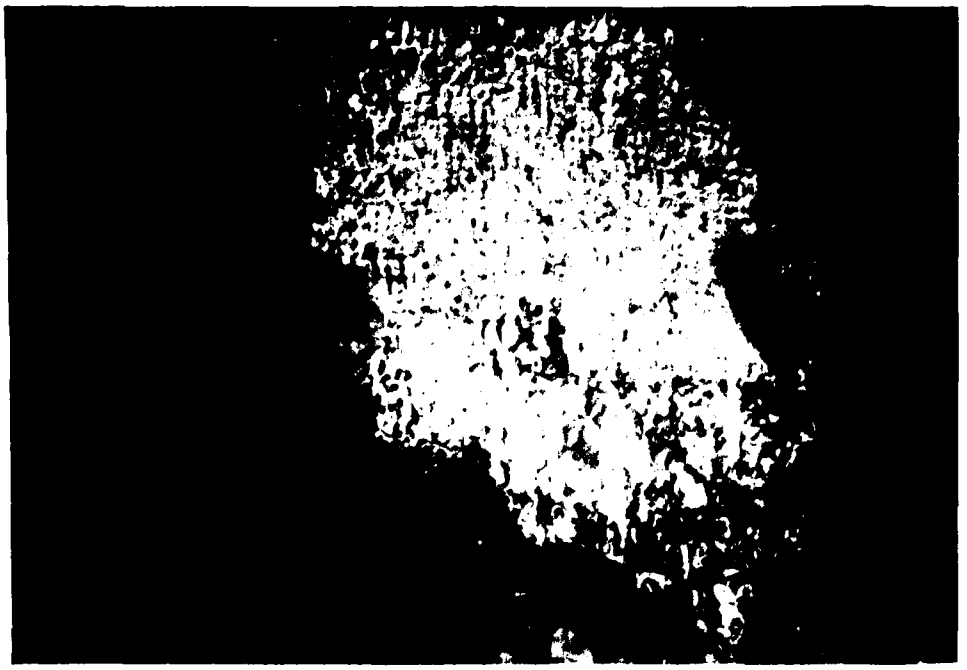
2.0
1.8
1.25
1.4
1.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PWC YOKOSUKA INSPECTION PHOTOGRAPHS



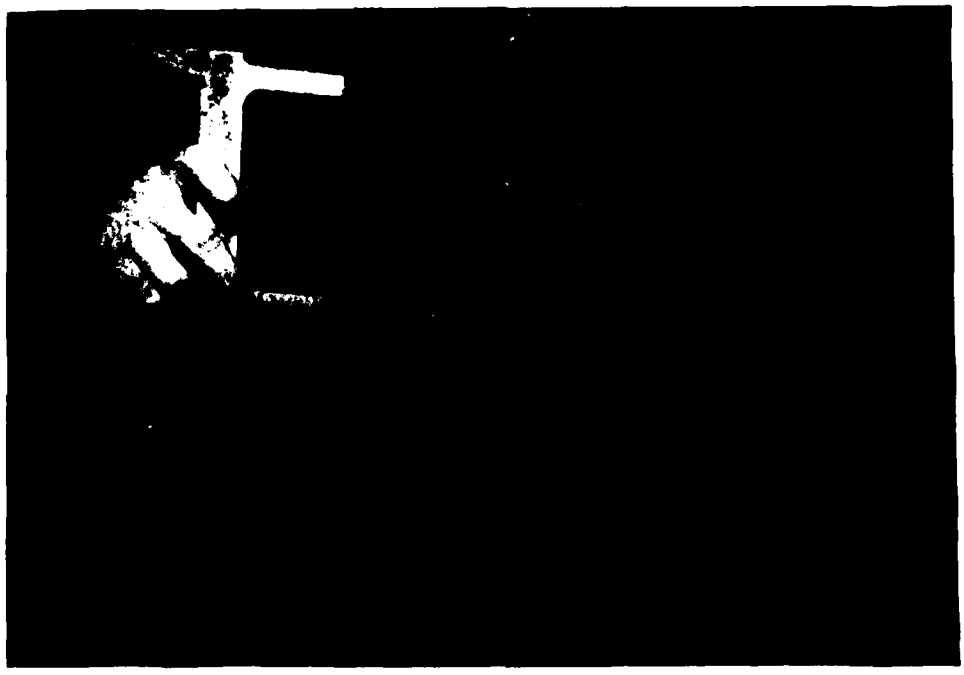
Typical Rust Bleeding Underneath the Fiberglass

Buoy D-4-N. Note Missing Section of Chafing Rail, Rusting, and Spot Painted Pad Eye



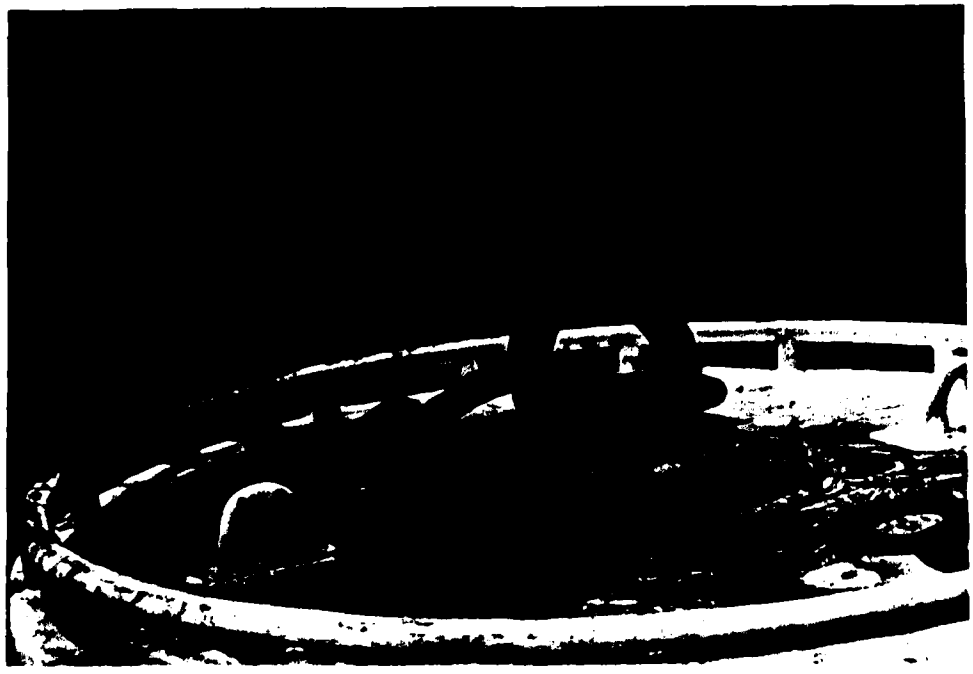
Typical Good Condition of Fiberglass on Buoy Hulls

Buoy D-5-N. Rusted Hawse Pipe and Riser Material



Mooring D-5-S. Little Marine Growth, Lightly Rusted Riser Chain Near the Mud Line

Buoy X-2. Excellent Condition



Rusted Top Deck, Chafing Rail, and Top Hardware of Buoy X-8

Mooring X-9. Riser Chain Connection to Sinker Hairpin with a Shackle

ANNEX D

REFERENCES

UNCLASSIFIED

01 03 RR UUUU 1661600

FROM: CHESNAVFACENGCOM WASHINGTON DC

TO: PWC YOKOSUKA JA

INFO PACNAVFACENGCOM PEARL HARBOR HI

COMNAVFACENGCOM ALEXANDRIA VA

UNCLAS //N11000//

SUBJ: FLEET MOORING INSPECTION

1. A CHESNAVFACENGCOM/UCT TWO UNDERWATER INSPECTION OF THE 20 MOORINGS LOCATED AT YOKOSUKA WAS CONDUCTED DURING THE PERIOD 1-6 MAY 83. THIS IS A PRELIMINARY REPORT OF THE INSPECTION RESULTS TO PROVIDE AN ALERT TO SEVERAL SIGNIFICANT FINDINGS:

A. MOORINGS X-3, X-6, X-7 AND X-15: GOOD CONDITION.

B. MOORINGS X-2, X-5 AND X-9: PORTIONS OF CHAIN WERE FOUND TO BE WORN TO BETWEEN 80 AND 90 PERCENT OF ITS ORIGINAL SIZE BUT WILL NOT REQUIRE DOWNGRADING SINCE THE CHAIN IS OVERSIZED FOR D-CLASS MOORINGS.

C. MOORING X-1: DESIGN DRAWING INDICATES TWO LEGS AT 80 DEGREE SEPARATION. LEGS WERE FOUND TO BE PARALLEL. LATERAL WIND LOADS COULD RESULT IN LARGE LATERAL DISPLACEMENT OF A SHIP MOORED BETWEEN X-1 AND X-2. RECOMMENDED CORRECTING LEG ORIENTATION AT NEXT OVER-

DISTR

TED JONES 433-3881 CODE: FPO-1C(PDC) 15 JUN 83 TJ	COPY TO: FPO-1C(PDC) TED, FPO-1C, FPO-10P2, 09/00, 0161, DAILY
RELEASED BY: H. S. STEVENSON, CDR, CEC, USN	SECURITY CLASSIFICATION: UNCLASSIFIED

DD 1731 2 OCR

PREVIOUS EDITION IS OBSOLETE AS OF 1 JAN 1980
S/N 0102-LF-080-1735

02 03 RR UUUU 1661600

HAUL.

D. MOORING X-8: 180 DEGREE ORIENTATION OF LEGS SHOWN IN DESIGN DRAWINGS APPEARS TOO LARGE FOR ANCHORS TO DEVELOP SUFFICIENT HOLDING CAPACITY. X-8 AND X-9 ARE USED AS A BOW-STERN MOORING. EXPECT LARGE DISPLACEMENT OF X-8 WHEN PULLED TOWARDS X-9. RECOMMEND REVIEW OF DESIGN ADEQUACY AND CORRECTION IAW DM-26 STANDARD DESIGN FOR BOW-STERN MOORINGS AT NEXT OVERHAUL.

E. MOORING D-3-S: ONLY THREE OF FOUR LEGS SHOWN IN DRAWINGS WERE FOUND TO BE CONNECTED - ORIENTATION UNKNOWN. BECAUSE THIS IS PART OF A SIX BUOY CLUSTER, THE MISSING LEG COULD ADVERSELY AFFECT THE PERFORMANCE OF MOORINGS D-3-N, D-4-N AND D-4-S AS WELL. RECOMMEND REVIEW DESIGN OF THIS BUOY CLUSTER CONSIDERING THE MISSING LEG.

F. MOORINGS D-12-N AND D-12-S: RECOMMEND DOWNGRADING FROM CLASS A TO CLASS B DUE TO USE OF 2 1/2 INCH CHAIN INSTEAD OF THE 2 3/4 INCH CHAIN REQUIRED FOR CLASS A.

G. MOORINGS D-2-N, D-2-S, D-3-N, D-3-S, D-4-N AND D-4-S: RECOMMEND DOWNGRADING FROM CLASS CC TO CLASS B. THESE MOORINGS UTILIZE THREE 2 1/2 INCH LEGS EACH. CLASS CC MOORINGS REQUIRE THREE PAIRS OF 2 3/4 INCH LEGS EACH.

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SIGNATURE

SECURITY CLASSIFICATION

UNCLASSIFIED

DD FORM 1473/2 (OCR)

PREVIOUS EDITION IS OBSOLETE AS OF 1 JAN 1980
S/N 0102-LF-000-1735

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H. MOORINGS D-5-N AND D-5-S: RECOMMEND DOWNGRADING FROM CLASS CC TO CLASS D. CLASS CC REQUIRES PAIRED 2 3/4 INCH LEGS. D-5-N HAS TWO INCH LEGS AND D-5-S HAS 2 1/4 INCH LEGS. THE TWO BUOYS ARE USED AS A SINGLE BOW-STERN MOORING.

I. MOORING X-4: RECOMMEND DOWNGRADING FROM CLASS D TO CLASS F DUE TO 1 3/4 INCH LEGS BEING WORN TO BETWEEN 80 AND 90 PERCENT OF THEIR ORIGINAL SIZE.

RECOMMENDED CLASS DESIGNATIONS ARE BASED ON STANDARD FLEET MOORING DESIGNS CONTAINED IN NAVFAC DM-26. ALTHOUGH THESE MOORINGS ARE OF JAPANESE DESIGN, IT IS RECOMMENDED THAT CHAIN SIZES AND LEG CONFIGURATIONS COMPLY WITH DM-26 MINIMUMS.

2. ABOVE INFO WAS DISCUSSED DURING MTG BTWN CDR SALTOUN (PWC YOKOSUKA) AND TED JONES (CHESNAVFACENGCOM) OF 6 MAY 83.

3. ANTICIPATE DISTRIBUTION OF DETAILED INSPECTION REPORT IN LATE JULY 83. CHESNAVFACENGCOM POC IS MR. TED JONES AT (202) 433-3881 OR AUTOVON 288-3881.

D STR

SPECIAL INSTRUCTIONS

SECURITY CLASSIFICATION

DD 1732 FOR

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ROUTINE

R 130600Z APR 83

FM PWC YOKOSUKA JA

TO CHESNAVFACENGCOM WASHINGTON DC

INFO COMNAVFACENGCOM ALEXANDRIA VA PACNAVFACENGCOM PEARL HARBOR HI
UCT TWO

BT
UNCLAS //N11000//

SUBJ: FLEET MOORING INSPECTIONS

A. CHESNAVFACENGCOM WASHINGTON DC 062030Z APR 83

1. INFO REF A, PARA TWO A THRU D, F AND H PROVID IN PWC YOKOSUKA JA LTR FILE 83042 OF 7 APR 83 PER PHONECON BTWN PWC CODE 102 AND CHESDIV CODE FPO-1 OF 30 MAR 83.

2. INFO REQ REF A, PARA TWO E AND G FOLLOW:
A. PARA E: NO ANTICIPATED USE OF CLASS A AND CLASS CC MOORINGS. HM, YC AND YCV BARGES WILL UTILIZE CLASS D MOORINGS X1 THRU X9 DURING PERIOD 1-21 MAY 1983. CLASS D MOORING X-15 WILL BE UTILIZED DURING PERIOD 10-21 MAY 1983.
B. PARA G: ALL MOORINGS ARE JOINT USE WITH GOVERNMENT OF JAPAN. NO U.S. SHIPS HAVE UTILIZED CLASS A AND CLASS CC MOORINGS DURING PAST THREE YEARS. JAPANESE EQUIVALENT OF AGB, AGS, AOE, ARC, ASE, ASU, DD, DDH AND TU RANGING IN SIZE FROM 223 FEET TO 522 FEET AND 950 TONS TO 11,700 TONS HAVE UTILIZED THESE MOORINGS PAST THREE YEARS. CLASS D MOORING X-15 DEDICATED TO U.S. USE. CLASS D MOORINGS X1 THRU X-9 JOINTLY USED - PRIMARILY BY HM, YC AND YCV BARGES.

3. PWC YOKOSUKA POINT OF CONTACT IS MR. A. YOSHIZAWA OR MR. D. NIELSEN AT AV 234-7507 OR 234-5342.
BT

DLVR:CHESNAVFACENGCOM WASHINGTON DC(9)...ACT

RTD:000-000/COPIES:0009

593060/103 1 OF 2 M1 0390 103/22:35Z 130600Z APR 83
CSN:PXOY00433 PWC YOKOSUKA JA

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JOINT MESSAGEFORM

PAGE		PRECEDENCE	CLASS			
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FROM: CHESNAVFACENGCOM WASHINGTON DC

TO: PWC YOKOSUKA JA

INFO COMNAVFACENGCOM ALEXANDR‾, VA

PACNAVFACENGCOM PEARL HARBOR HI

UCT TWO

UNCLAS //N11000//

SUBJ: FLEET MOORING INSPECTIONS

1. AS DISCUSSED IN TELEPHONE CONVERSATION BETWEEN MR. YOSHI ZAWA {PWC, YOKOSUKA} AND MR. TED JONES {CHESNAVFACENGCOM} ON 29 MAR 83. CHESNAVFACENGCOM, WITH SUPPORT FROM UCT TWO, PLANS TO CONDUCT AN UNDERWATER INSPECTION OF THE 20 MOORINGS OPERATED AND MAINTAINED BY PWC, YOKOSUKA AS PART OF THE COMNAVFACENGCOM FLEET MOORING MAINTENANCE {FMM} PROGRAM DURING THE PERIOD 1-21 MAY 83.. AVAILABLE DATA INDICATES 8 CLASS CC MOORINGS IN 30-47 FEET OF WATER, 2 CLASS A MOORINGS IN 30-42 FEET OF WATER, AND 10 CLASS D MOORINGS IN 15-43 FEET OF WATER.

2. THE FLEET MOORING INSPECTION TEAM WILL CONSIST OF A CHESDIV ENGINEER-IN-CHARGE {EIC} AND A DET FROM UCT TWO. IN ORDER TO PREPARE A DETAILED INSPECTION PLAN, THE FOLLOWING INFORMATION IS REQUIRED

DISTR:

DRAFTER TYPED NAME, TITLE, OFFICE SYMBOL, PHONE	SPECIAL INSTRUCTIONS
TED JONES, FPO-1C{PDC} 433-3881 6 APR 1983	COPY TO: 09..00..FPO-1C..DAILY.. FPO-1C{PDC}.FPO-10P2..FPO-1C7..
RELEASER TYPED NAME, TITLE, OFFICE SYMBOL AND PHONE: H. S. STEVENSON, CDR, CEC, USN	0161 MINIMIZED CONSIDERED
SIGNATURE	SECURITY CLASSIFICATION / DATE TIME GROUP: 062030Z APR 83

DD FORM 1 MAR 79 173/2 (OCR) PREVIOUS EDITION IS OBSOLETE S/N 0102-LF-000-1735

02 OF 03		RR	UUUU		0961500

PER MOORING

A. MAINTENANCE HISTORY - WHEN INSTALLED, WHEN INSPECTED, WHEN OVERHAULED, LAST REPORTED CONDITION, ETC.

B. COPIES OF MOORING DESIGN CALCULATIONS AND DRAWINGS.

C. COPIES OF "AS-BUILT" MATERIALS LIST.

D. FACILITY MAP SHOWING LOCATION OF ALL MOORINGS WITH SPECIFIC LOCATIONS FOR THOSE CURRENTLY IN USE.

E. ANTICIPATED MOORING USAGE DURING THE INSPECTION PERIOD - TYPES OF SHIPS.

F. PLANNED REPAIRS AND OVERHAULS - PARTICULARLY THOSE BEFORE THIS INSPECTION.

G. TYPES AND CLASSES OF SHIPS USING MOORINGS.

H. WHETHER CATHODIC PROTECTION SYSTEMS ARE INSTALLED AND TYPE OF MATERIAL UTILIZED.

3. PWC, YOKOSUKA IS REQUESTED TO MAIL THE ABOVE INFORMATION AS SOON AS POSSIBLE TO CHESNAVFACENGCOM (CODE FPO-1C7), BLDG. 212, WASHINGTON NAVY YARD, WASHINGTON, D. C. 20374.

4. ADDITIONALLY, PWC, YOKOSUKA IS REQUESTED TO REPLY BY MESSAGE WITH THE ABOVE INFORMATION EXCEPT FOR DRAWINGS AND MAPS BY 15 APR 83.

DISTR:

DRAFTER TYPED NAME, TITLE, OFFICE SYMBOL, PHONE

SPECIAL INSTRUCTIONS

RELEASER TYPED NAME, TITLE, OFFICE SYMBOL AND PHONE

SIGNATURE

SECURITY CLASSIFICATION

DATE TIME GROUP

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5. CHESNAVFACENGCOM POINT OF CONTACT IS MR. J. MCLAUGHLIN OR MR. T. JONES AT AUTOVON 286-3881 OR (202) 433-3881.

6. YOUR TIMELY SUPPORT WILL BE GREATLY APPRECIATED.

0123456

DISTR

DRAFTER TYPED NAME TITLE OFFICE SYMBOL PHONE	SPECIAL INSTRUCTIONS	
RELEASER: TYPED NAME TITLE OFFICE SYMBOL AND PHONE		
SIGNATURE	SECURITY CLASSIFICATION	DATE TIME GROUP

DD FORM 1 MAR 79 173/2 (OCR) PREVIOUS EDITIONS IS OBSOLETE S/N 0102-LF-000-1735

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ROUTINE

R 2103312 AUG 82

FM CINCPACFLT PEARL HARBOR HI

TO COMCBPAC PEARL HARBOR HI

INFO CHNAVMAT WASHINGTON DC
COMNAVAIRSYSCOM WASHINGTON DC
COMNAVFACENGCOM ALEXANDRIA VA
COMNAVTELCOM WASHINGTON DC
COMNAVSURFPAC SAN DIEGO CA
COMNAVAIRPAC SAN DIEGO CA
CG FMFPAC
COMUCEANSYSPAC PEARL HARBOR HI
COMNAVMARIANAS GUAM
COMPACMISTESTCEN FT MUGU CA
WESTNAVFACENGCOM SAN BRUNO CA
OICC MIDPAC PEARL HARBOR HI
OICC GUAM
OICC DIEGO GARCIA HOUSTON TX
PWC GUAM
PWC YOKOSUKA JA
PWC SAN FRANCISCO CA
COMC THREE ZERO NCR GUAM
NAVPAL CENTERVILLE BEACH CA
NAVSTA SEAL BEACH CA
NAVSHIPREPFAC SUBIC BAY RP
NAF ATSUGI JA
NAVSHIPYD PUGET SOUND WA
NSC SAN DIEGO CA
T-TREPFAC BANGOR WA
NSC GUAM
NAVSUPPFAC DIEGO GARCIA
NAVSTA LONG BEACH CA
NSC PEARL HARBOR HI
NAVSHIPYD MARE ISLAND CA
PACMISRANFAC MAKAHEA BARKING SANDS HI
COMNAVSEASYSCOM WASHINGTON DC
COMNAVELEXSYSCOM WASHINGTON DC
CNR ARLINGTON VA
COMNAVLOGPAC PEARL HARBOR HI
COMSUBPAC PEARL HARBOR HI
COMTHIRDFLT
COMMARCORBASESPAC CAMP H M SMITH HI
COMNAVFORJAPAN YOKOSUKA JA
COMUSNAVPHIL SUBIC BAY RP
PACNAVFACENGCOM PEARL HARBOR HI
CHESNAVFACENGCOM WASHINGTON DC
OICC SUWESTPAC MANILA RP
OICC FAR EAST YOKOSUKA JA
PWC PEARL HARBOR HI
PWC SUBIC BAY RP
PWC SAN DIEGO CA
COMC THREE ONE NCR PORT HUENEME CA
UCT TWO
NAVOCEANSYSCEN SAN DIEGO CA
NSD SUBIC BAY RP
MCAS IWAKUNI JA
NAVUSEAWARENGSTA KEYPORT WA
NAVMAG LUALUALEI HI
SUBASE BANGOR WA
NAVPHIBASE CORONADO SAN DIEGO CA
NAVSHIPREPFAC GUAM
NAVSTA SAN DIEGO CA
NAVSHIPYD PEARL HARBOR HI
SUBASE PEARL HARBOR HI

BT
UNCLAS //N11000//

SUBJ: UCT TWO FY83 EMPLOYMENT TASKING

DLVR:CHESNAVFACENGCOM WASHINGTON DC(9)...INFO

RTD:000-000/COPIES:0009

114776/235 1 OF 3 M1 0308 235/23:21Z 2103312 AUG 82
CSN:RXDY00304 CINCPACFLT PEARL HARBOR HI

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U U N C L A S S I F I E D U
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A. CINCPACFLT PEARL HARBOR HI 260654Z JUN 82

1. REF A REQUESTED NOMINATIONS OF PROJECTS FOR UCT TWO ACCOMPLISHMENT FY83-85. FROM THE RESPONSES TO REF A THE FOLLOWING PROJECTS ARE TASKED FOR ACCOMPLISHMENT IN FY83:

A. CENTERVILLE BEACH (CLASSIFIED)
B. ARCTIC WEST (CLASSIFIED).
C. BARKING SANDS, HI, CABLE LANDING AND REPAIRS
D. WPNSTA SEAL BEACH, DEMOLISH ANAHEIM BAY BRIDGE
E. NSD SUBIC, PILE REPAIR POL PIER
F. NSD SUBIC, PILE REPAIR MARINE TERMINAL PIER PHASE I (REPAIR ALL SEVERE AND MAJOR DAMAGE)
G. NAVSHIPREPFAC SUBIC, INSPECT ALAVA WHARF
H. FLEET MOORING INSPECTION - PACIFIC DATA BASE (PEARL HARBOR HI, GUAM, YOKOSUKA, IWAKUNI, SASEBO, INDIAN ISLAND WA, BREMERTON WA)
I. NAVMAG LUALUALEI, INSPECT AMMO PIERS W1-5
J. UNDERWATER INSPECTION PROGRAM (NSC SAN DIEGO)
K. SUBASE, BANGOR WA, UNDERWATER INSPECTION
L. TRIREFFAC BANGOR WA, UNDERWATER MSF RANGE REPAIR
M. DEGAUSSING RANGE SURVEY, SAN FRANCISCO CA
N. NAVPHIBASE CORONADO SAN DIEGO CA, PIER INSPECTIONS

2. THE FOLLOWING PROJECTS ARE TASKED AS FILL IN WORK FOR FY83:

A. UNDERWATER INSPECTION PROGRAM (NAVSTA PEARL HARBOR)
B. NAVUSEAWAKENGSTA KEYPORT WA, INDIAN IS PHASE TWO MOORING
C. NSD GUAM, REPAIRS TO SIERRA WHARF GUAM.
REQUIRES COORDINATION WITH ON SITE NMCB FOR ACCOMPLISHMENT.

THE FOLLOWING PROJECTS ARE TENTATIVELY TASKED FOR ACCOMPLISHMENT AS INDICATED:

A. FY-84
(1) ARCTIC WEST (CLASSIFIED)
(2) NAVSHIPREPFAC GUAM, REPAIRS TO LIMA WHARF
(3) FLEET MOORING INSPECTION - PACIFIC DATA BASE 9SUBIC BAY, NSF DIEGO GARCIA, PWC SAN DIEGO, NAVSTA SAN DIEGO, WPNGTA SEAL BEACH, NAVSTA LONG BEACH)
(4) NSD SUBIC, WATERFRONT FACILITIES INSPECTION
(5) NSD SUBIC, MONOBUOY FUEL LINE REPAIRS
(6) DEGAUSSING RANGE SAN FRANCISCO, RANGE INSTALLATION
(7) UNDERWATER INSPECTION PROGRAM CNAVSHIPY PEARL HARBOR, NSC PEARL HARBOR, SUBASE PEARL HARBOR)
(8) SCARF REPAIR/INSPECTION
(9) BARKING SANDS, UNDERWATER RANGE REPAIRS
(10) NSD SUBIC, PILE REPAIR MARINE TERMINAL PIER PHASE 2

(REPAIRS TO MODERATE AND MINOR DAMAGE)

B. FY-85

(1) ARCTIC NEST (CLASSIFIED)

(2) BARKING SANDS - UNDERWATER RANGE WORK

(3) FLEET MOORING INSPECTION - PACIFIC DATA BASE PEARL HARBOR HI, GUAM, JAPAN, PUGET SOUND WA)

(4) UNDERWATER INSPECTION PROGRAM (MARE ISLAND CA)

(5) SUBASE PEARL, MCON P-088, REPAIR AND EXTEND SEAWALL THIS PROJECT WILL REQUIRE SEPARATE TASKING OF AN RNMCB, CBU OR OTHER ORGANIZATION AS "PRIME CONTRACTOR" FOR PILE DRIVING AND TOPSIDE WORK WITH UCT ACCOMPLISHING ALL WATER SUPPORT.

END

DTIC

6-86